PETITION ON RECOMBINANT DNA RESEARCH

To: The Mayor and Council of the City of Cambridge, Massachusetts

We the undersigned are deeply troubled by the risks entailed by the use of recombinant DNA techniques through which foreign genes are implanted in bacteria and other living organisms. The risks to human and other forms of life from rearranging the products of hundreds of millions of years of evolution are serious and proposed safety measures are inadequate.

It is our view that (1) the guidelines to be released by the National Institutes of Health have been based largely, although not exclusively on the input of the practitioners themselves, (2) there has been neither advised public consent nor explicit formulation of policy for this hazardous area of research and development, (3) proliferation of facilities will enhance the chance of disaster, (4) the alleged benefits to medicine and industry are not so imminent that this form of research cannot be postponed until a more comprehensive and representative dialogue has taken place.

We therefore urge that the City Council of Cambridge deny building permits for recombinant DNA facilities at Harvard and elsewhere until a broadly representative body is appointed at the national level to develop policy for use of recombinant DNA techniques and reports, and until a final decision on the acceptability of the risks for the Cambridge community is made by a local committee.

No policy, or guidelines, for research is acceptable without public participation and public involvement.

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Name (Please print)	Address	Signature
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John G von Jess	100 Arlington St Acton Ma	John G von Jess
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Name (Please print)	Address	Signature
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Dennis Overbye	18 Sparks St	Dennis Overbye

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Mary Sue Hendrix	Harvard University Herbarium, Harvard	Mary Sue Hendrix

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Stephen L. Chorover	262 Clinton Rd	Stephen Chorover
Marilyn Richmond	2 Inman St.	Marilyn E. Richmond
Sheldon Richmond	2 Inman St	Sheldon Richmond
Victoria E. Morris	2 Wyatt Cir.	Victoria E. Morris
Johanna M. Lessinger	14 Hamlin St., Camb.	Johanna M. Lessinger
Dr. Leslie Lessinger	14 HAMLIN ST, CAMB.	Leslie Lessinger
Dale Runge	30 HAMILTON RD, ARL	Dale Runge
Rachel Horwich	68 Dimick St., Somerville	Rachel Horwich

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INA GOODMAN		Ina Goodman

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federal register

Friday
April 11, 1980

Part II

Department of Health, Education, and Welfare

National Institutes of Health

Recombinant DNA Research; Physical Containment Recommendations for Large-Scale Uses of Organisms Containing Recombinant DNA Molecules

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health

Recombinant DNA Research; Physical Containment Recommendations for Large-Scale Uses of Organisms Containing Recombinant DNA Molecules

AGENCY: National Institutes of Health (NIH), HEW.

ACTION: Publication of physical containment recommendations for large-scale uses of organisms containing recombinant DNA molecules.

SUMMARY: These physical containment recommendations for large-scale uses of organisms containing recombinant DNA molecules are published for public information in accordance with the recommendation of the NIH Recombinant DNA Advisory Committee.

FOR FURTHER INFORMATION CONTACT: Dr. W. Emmett Barkely, Director, Division of Safety, Building 13, Room 2E45, National Institutes of Health, Bethesda, Maryland 20205.

SUPPLEMENTAL INFORMATION: The NIH Guidelines for Research Involving Recombinant DNA Molecules (45 FR 6724, January 29, 1980) specify in Section IV-E-1-b-(3)-(d) that the Director, NIH, is responsible for "authorizing, under procedures specified by the RAC, large-scale experiments (i.e., involving more than 10 liters of culture) for recombinant DNAs that are rigorously characterized and free of harmful sequences."

At its September 6-7, 1979, meeting, the NIH Recombinant DNA Advisory Committee (RAC) adopted (by a vote of 14 in favor, none opposed, and 3 abstentions) procedures to be followed in reviewing such large-scale experiments. These procedures included the submission by the applicant of certain information including "a description of the applicant's laboratory practices, containment equipment, and facilities rlevant to the containment of large volumes of culture."

At its May 21-23, 1979, meeting, the RAC approved (by a vote of 19 in favor, none opposed, and no abstentions) the creation of a working group to "examine physical containment requirements for large-scale experiments and that a document should be prepared."

At its December 6-7, 1979, meeting, the RAC reviewed Draft Physical Containment Guidelines for Large-Scale Uses of Organisms Containing Recombinant DNA Molecules and voted (15 in favor, none opposed, and no abstentions) that additional comments be solicited on the draft standards.

At its March 6-7, 1980, meeting, the RAC reviewed Draft Physical Containment Guidelines for Large-Scale Use of Organisms Containing Recombinant DNA Molecules which had been revised from the earlier draft, based upon comments received. Following considerable discussion at the meeting, a motion was passed (with 16 in favor, 2 opposed, and 1 abstention) that the document be published in the **Federal Register.**

The document which is now published in the **Federal Register** contains changes from that reviewed by the RAC on March 7, 1980, based upon suggestions made at the March 7 meeting. These changes are:—(1) To eliminate what was Section VII-C-6 in the draft reviewed by the RAC on March 7, 1980; Section VII-D-6 which consists of identical text has been retained.—(2) To change the phrase "using a non-debilitated strain of the host organisms used in the research or production process" to "using the organism that will serve as the host for propagating the recombinant DNA molecules" in Section VII-B-2, VII-B-5, VII-C-2, VII-C-5, VII-C-6, VII-D-2, VII-D-5, and VII-D-9.

When earlier drafts of this document had been prepared it was proposed that it might eventually be formally promulgated as Part VII of the NIH Guidelines for Research Involving Recombinant DNA Molecules. It has not in fact been formally adopted as Part VII of the NIH Guidelines. The format has, however, been retained in this *Draft* Part VII. This document, while not formally part of the NIH Guidelines, can serve as a model for those preparing submissions to the NIH under the NIH Guidelines.

The document now published in the **Federal Register** is endorsed by the NIH Division of Safety as physical containment recommendations appropriate for large-scale uses of organisms containing recombinant DNA molecules.

Dated: March 31, 1980.

Donald S. Fredrickson,

Director, National Institutes of Health.

Draft Part VII of the NIH Guidelines for Research Involving Recombinant DNA Molecules

VII. Physical Containment for Large-Scale Uses of Viable Organisms Containing Recombinant DNA Molecules

This part of the NIH Guidelines specifies physical containment guidelines for large-scale (greater than 10 liters of culture) research or production involving viable organisms containing recombinant DNA molecules. It shall apply to all large-scale research or production activities approved by the Director, NIH in accordance with Sections IV-E-2-b-(1)-(e) and IV-E-1-b-(3)-(d) of the NIH Guidelines.

All provisions of the NIH Guidelines shall apply to large-scale research or production activities with the following modifications:

- Part VII shall replace Section II-B when quantities in excess of 10 liters of culture are involved in research or production.
- The institution shall appoint a biological safety officer if it engages in large-scale research or production activities involving viable organisms containing recombinant DNA molecules. The duties of the biological safety officer shall include those specified in Section IV-D-4.
- The institution shall establish and maintain a health surveillance program for personnel engaged in large-scale research or production activities involving viable organisms containing recombinant DNA molecules which require P3 containment at the laboratory scale. The program shall include: preassignment and periodic physical and medical examinations; collection, maintenance and analysis of serum specimens for monitoring serologic changes that may result from the employee's work experience; and provisions for the investigation of any serious, unusual or extended illnesses of employees to determine possible occupational origin.

VII-A. *Selection of Physical Containment Levels.* The selection of the physical containment level required for recombinant DNA research or production involving more than 10 liters of culture is based on the containment guidelines established in Part III of the Guidelines. For purposes of large-scale research or production, three physical containment levels are established. These are referred to as P1-LS, P2-LS, and P3-LS. The P1-LS level of physical containment is required for large-scale research or production of viable organisms containing recombinant DNA molecules which require P1 containment at the laboratory scale. The P2-LS level of physical containment is required for large-scale research or production of viable organisms containing recombinant DNA molecules which require P2 containment at the laboratory scale. The P3-LS level of physical containment is required for large-scale research or production of viable organisms containing recombinant DNA molecules which require P3 containment at the laboratory scale. No provisions

are made for large-scale research or production of viable organisms containing recombinant DNA molecules which require P4 containment at the laboratory scale. If necessary, these requirements will be established on an individual case basis.

VII–B. *P1–LS Level.*

VII–V–1. Cultures of viable organisms containing recombinant DNA molecules shall be handled in a closed system (e.g., closed vessel used for the propagation and growth of cultures) or other primary containment equipment (e.g., biological safety cabinet containing a centrifuge used to process culture fluids) which is designed to reduce the potential for escape of viable organisms. Volumes less than 10 liters may be handled outside of a closed system or other primary containment equipment providing all physical containment requirements specified in Section II–B–1. of the Guidelines are met.

VII–B–2. Culture fluids (except as allowed in VII–B3,) shall not be removed from a closed system or other primary containment equipment unless the viable organisms containing recombinant DNA molecules have been inactivated by a validated inactivation procedure. A validated inactivation procedure is one which has been demonstrated to be effective using the organism that will serve as the host for propagating the recombinant DNA molecules.

VII–B–3. Sample collection from a closed system, the addition of materials to a closed system and the transfer of culture fluids from one closed system to another shall be done in a manner which prevents the release of aerosols or contamination of exposed surfaces.

VII–B–4. Exhaust gases removed from a closed system or other primary containment equipment shall be treated by filters which have efficiencies equivalent to HEPA filters or by other equivalent procedures (e.g., incineration) to prevent the release of viable organisms containing recombinant DNA molecules to the environment.

VII–B–5. A closed system or other primary containment equipment that has contained viable organisms containing recombinant DNA molecules shall not be opened for maintenance or other purposes unless it has been sterilized by a validated sterilization procedure. A validated sterilization procedure is one which has been demonstrated to be effective using the organism that will serve as the host for propagating the recombinant DNA molecules.

VII–B–6. Emergency plans required by Section IV–D–3–d. shall include methods and procedures for handling large losses of culture on an emergency basis.

VII–C. *P2–LS Level.*

VII–C–1. Cultures of viable organisms containing recombinant DNA molecules shall be handled in a closed system (e.g., closed vessel used for the propagation and growth of cultures) or other primary containment equipment (e.g., Class III biological safety cabinet containing a centrifuge used to process culture fluids) which is designed to prevent the escape of viable organisms. Volumes less than 10 liters may be handled outside of a closed system or other primary containment equipment providing all physical containment requirements specified in Section II–B–2. of the Guidelines are met.

VII–C–2. Culture fluids (except as allowed in VII–C–3.) shall not be removed from a closed system or other primary containment equipment unless the viable organisms containing recombinant DNA molecules have been inactivated by a validated inactivation procedure. A validated inactivation procedure is one which has been demonstrated to be effective using the organism that will serve as the host for propagating the recombinant DNA molecules.

VII–C–3. Sample collection from a closed system, the addition of materials to a closed system, and the transfer of cultures fluids from one closed system to another shall be done in a manner which prevents the release of aerosols or contamination of exposed surfaces.

VII–C–4. Exhaust gases removed from a closed system or other primary containment equipment shall be treated by filters which have efficiencies equivalent to HEPA filters or by other equivalent procedures (e.g. incinereation) to prevent the release of viable organisms containing recombinant DNA molecules to the environment.

VII–C–5. A closed system or other primary containment equipment that has contained viable organisms containing recombinant DNA molecules shall not be opended for maintenance or other purposes unless it has been sterilized by a validated sterilization procedure. A validated sterilization procedure is one which has been demonstrated to be effective using the organism that will serve as the host for propagating the recombinant DNA molecules.

VII–C–6. Rotating seals and other mechanical devices directly associated with a closed system used for the propagation and growth of viable organisms containing recombinant DNA molecules shall be designed to prevent leakage or shall be fully enclosed in ventilated housings that are exhasted through filters which have efficiencies equivalent to HEPA filters or through other equivalent treatment devices.

VII–C–7. A closed system used for the propagation and growth of viable organisms containing recombinant DNA molecules and other primary containment equipment used to contain operations involving viable organisms containing recombinant DNA molecules shall include monitoring or sensing devices that monitor the integrity of containment during operations.

VII–C–8. A closed system used for the propagation and growth of viable organisms containing the recombinant DNA molecules shall be tested for integrity of the containment features using the organism that will serve as the host for propagating recombinant DNA molecules. Testing shall be accomplished prior to the introduction of viable organisms containing recombinant DNA molecues, and following modification or replacement of essential containment features. Procedures and methods used in the testing shall be appropriate for the equipment design and for recovery and demonstration of the test organism. Records of tests and results shall be maintained on file.

VII–C–9. A closed system used for the propagation and growth of viable organisms containing recombinant DNA molecules shall be permanently identified. This identification shall be used in all records reflecting testing, operation, and maintenance and in all documentation relating to the use of this equipment for research or production activities involving viable organisms containing recombinant DNA molecules.

VII–C–10. The universal biohazard sign shall be posted on each closed system and primary containment equipment when used to contain viable organisms containing recombinant DNA molecules.

VII–C–11. Emergency plans required by Section IV–D–3–d shall include methods and procedures for handling large losses of culture on an emergency basis.

VII–D. *P3–LS Level.*

VII–D–1. Cultures of viable organisms containing recombinant DNA molecules shall be handled in a closed system (e.g., closed vessels used for the propagation and growth of cultures) or other primary containment equipment (e.g., Class III biological safety cabinet containing a centrifuge used to process culture fluids) which is designed to prevent the escape of viable organisms. Volumes less than 10 liters may be handled outside of a closed system providing all physical containment requirements specified in Section II–B–3 of the Guidelines are met.

VII–D–2. Culture fluids (except as allowed in VII–D–3) shall not be removed from a closed system or other primary containment equipment unless the viable organisms containing recombinant DNA molecules have been inactivated by a validated inactivation procedure. A validated inactivation procedure is one which has been demonstrated to be effective using the organisms that will serve as the host for propagating the recombinant DNA molecules.

VII–D–3. Sample collection from a closed system, the addition of materials to a closed system, and the transfer of culture fluids from one closed system to another shall be done in a manner which prevents the release of aerosols or contamination of exposed surfaces.

VII–D–4. Exhaust gases removed from a closed system or other primary containment equipment shall be treated by filters which have efficiencies equivalent to HEPA filters or by other equivalent procedures (e.g. incineration) to prevent the release of viable organisms containing recombinant DNA molecules to the environment.

VII–D–5. A closed system or other primary containment equipment that has contained viable organisms containing recombinant DNA molecules shall not be opened for maintenance or other purposes unless it has been sterilized by a validated sterilization procedure. A validated sterilization procedure is one which has been demonstrated to be effective using the organisms that will serve as the host for propagating the recombinant DNA molecules.

VII–D–6. A closed system used for the propagation and growth of viable organisms containing recombinant DNA molecules shall be operated so that the space above the culture level will be maintained at or slightly below atmospheric pressure.

VII–D–7. Rotating seals and other mechanical devices directly associated with a closed system used to contain viable organisms containing recombinant DNA molecules shall be be designed to prevent leakage or shall be fully enclosed in ventilated housings that are exhausted through filters which have efficiencies equivalent to HEPA filters or through other equivalent treatment devices.

VII–D–8. A closed system used for the propagation and growth of viable organisms containing recombinant DNA molecules and other primary containment equipment used to contain operations involving viable organisms containing recombinant DNA molecules shall include monitoring or sensing devices that monitor the integrity of containment during operations.

VII–D–9. A closed system used for the propagation and growth of viable organisms containing recombinant DNA molecules shall be tested for integrity of the containment features using the organisms that will serve as the host for propagating the recombinant DNA molecules. Testing shall be accomplished prior to the introduction of viable organisms containing recombinant DNA molecules, and following modification or replacement of essential containment features. Procedures and methods used in the testing shall be appropriate for the equipment design and for recovery and demonstration of the test organism. Records of tests and results shall be maintained on file.

VII–D–10. A closed system used for the propagation and growth of viable organisms containing recombinant DNA molecules shall be permanently identified: This identification shall be used in all records reflecting testing, operation and maintenance and in all documentation relating to the use of this equipment for research or production activities involving viable organisms containing recombinant DNA molecules.

VII–D–11. The universal biohazard sign shall be posted on each closed system and primary containment equipment when used to contain viable organisms containing recombinant DNA molecules.

VII–D–12. Emergency plans required by Section IV–D–3–d shall include methods and procedures for handling large losses of culture on an emergency basis.

VII–D–13. Closed systems and other primary containment equipment used in handling cultures of viable organisms containing recombinant DNA molecules shall be located within a controlled area which meets the following requirements:

VII–D–13–a. The controlled area shall have a separate entry area. The entry area shall be a double-doored space such as an air lock, anteroom or change room that separates the controlled area from the balance of the facility.

VII–D–13–b. The surfaces of walls, ceilings, and floors in the controlled area shall be such as to permit ready cleaning and decontamination.

VII–D–13–c. Penetrations into the controlled area shall be sealed to permit liquid or vapor phase space decontamination.

VII–D–13–d. All utilities and service or process piping and wiring entering the controlled area shall be protected against contamination.

VII–D–13–e. Handwashing facilities equipped with foot-, elbow-, or automatically-operated valves shall be located at each major work area and near each primary exit.

VII–D–13–f. A shower facility shall be provided. This facility shall be located in close proximity to the controlled area.

VII–D–13–g. The controlled area shall be designed to preclude release of culture fluids outside the controlled area in the event of an accidental spill or release from the closed systems or other primary containment equipment.

VII–D–13–h. The controlled area shall have a ventilation system that is capable of controlling air movement. The movement of air shall be from areas of lower contamination potential to areas of higher contamination potential. If the ventilation system provides positive pressure supply air, the system shall operate in a manner that prevents the reversal of the direction of air movement or shall be equipped with an alarm that would be actuated in the event that reversal in the direction of air movement were to occur. The exhaust air from the controlled area shall not be recirculated to other areas of the facility. The exhaust air from the controlled area may be discharged to the outdoors without filtration or other means for effectively reducing an accidental aerosol burden provided that it can be dispersed clear of occupied buildings and air intakes.

VII–D–14. The following personnel and operational practices shall be required:

VII–D–14–a. Personnel entry into the controlled area shall be through the entry area specified in section VII–D–13–a.

VII–D–14–b. Persons entering the controlled area shall exchange or cover their personal clothing with work garments such as jumpsuits, laboratory coats, pants and shirts, head cover, and shoes or shoe covers. On exit from the controlled area the work clothing may be stored in a locker separate from that used for personal clothing or discarded for laundering. Clothing shall be decontaminated before laundering.

VII–D–14–c. Entry into the controlled area during periods when work is in progress shall be restricted to those persons required to meet program or support needs. Prior to entry all persons shall be informed of the operating practices, emergency procedures, and the nature of the work conducted.

VII–D–14–d. Persons under 18 years of age shall not be permitted to enter the controlled area.

VII–D–14–e. The universal biohazard sign shall be posted on entry doors to the controlled area and all internal doors when any work involving the organism is in progress. This includes periods when decontamination

procedures are in progress. The sign posted on the entry doors to the controlled area shall include a statement of agents in use and personnel authorized to enter the controlled area.

VII–D–14–f. The controlled area shall be kept neat and clean.

VII–D–14–g. Eating, drinking, smoking and storage of food are prohibited in the controlled area.

VII–D–14–h. Animals and plants shall be excluded from the controlled area.

VII–D–14–i. An effective insect and rodent control program shall be maintained.

VII–D–14–j. Access doors to the controlled area shall be kept closed, except as necessary for access, while work is in progress. Service doors leading directly outdoors shall be sealed and locked while work is in progress.

VII–D–14–k. Persons shall wash their hands when leaving the controlled area.

VII–D–14–l. Persons working in the controlled area shall be trained in emergency procedures.

VII–D–14–m. Equipment and materials required for the management of accidents involving viable organisms containing recombinant DNA molecules shall be available in the controlled area.

VII–D–14–n. The Controlled area shall be decontaminated in accordance with established procedures following spills or other accidental release of viable organisms containing recombinant DNA molecules.

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Part VII

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Guidelines for Research Involving Recombinant DNA Molecules, November 1980

HEALTH AND HUMAN SERVICES DEPARTMENT

National Institutes of Health

Guidelines for Research Involving Recombinant DNA Molecules, November 1980

These NIH Guidelines supersede those of January 1980, and will be in effect until further notice.

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I. Scope of the Guidelines

I-A. *Purpose.* The purpose of these Guidelines is to specify practices for constructing and handling (i) recombinant DNA molecules and (ii) organisms and viruses containing recombinant DNA molecules.

I-B. *Definition of Recombinant DNA Molecules.* In the context of these Guidelines, recombinant DNA molecules are defined as either (i) molecules which are constructed outside living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell, or (ii) DNA molecules that result from the republication of those described in (i) above.

I-C. *General Applicability.* See Section IV-B.

I-D. *Prohibitions.* The following experiments are not to be initiated at the present time:

I-D-1. Formation of recombinant DNAs derived from the pathogenic organisms classified (*1*) as Class 4 or 5 (*2*) or from cells known (*2A*) to be infected with such agents, regardless of the host-vector system used.

I-D-2. Deliberate formation of recombinant DNAs containing genes for the biosynthesis of toxins potent for vertebrates (*2A*) (e.g., botulinum or diphtheria toxins; venoms from insects, snakes, etc.).

I-D-3. (Deleted).

I-D-4. Deliberate release into the environment of any organism containing recombinant DNA.

I-D-5. Deliberate transfer of a drug resistance trait to microorganisms that are not known to acquire it naturally, if such acquisition could compromise the use of a drug to control disease agents in human or veterinary medicine or agriculture. (*2A*)

I-D-6. Large-scale experiments (e.g., more than 10 liters of culture) with organisms containing recombinant DNAs, unless the recombinant DNAs are rigorously characterized and the absence of harmful sequences established (*a*). (See Section IV-E-1-b-(3)-(d).)

I-D (1-6). Experiments in Categories I-D-1 to I-D-6 may be expected (*4*) from the prohibitions (and will at that time be assigned appropriate levels of physical and biological containment) provided that these experiments are expressly

approved by the Director, National Institutes of Health (NIH), with advice of the Recombinant DNA Advisory Committee (RAC), after appropriate notice and opportunity for public comment. (See Section IV–E–1–b–(1)–(e).)

Experiments in Categories I–D–1, I–D–2, I–D–5, and experiments involving "wild type" host-vector systems are excepted from the prohibitions, provided that these experiments are designed for risk-assessment purposes and are conducted within the NIH high-containment facilities located in Building 41–T on the Bethesda campus and in Building 550 located at the Frederick Cancer Research Center. The selection of laboratory practices and containment equipment for such experiments shall be approved by the Office of Recombinant DNA Activities (ORDA) following consultation with the RAC Risk Assessment Subcommittee and the NIH Biosafety Committee. ORDA shall inform RAC members of the proposed risk-assessment projects at the same time it seeks consultation from the RAC Risk Assessment Subcommittee and the NIH Biosafety Committee. If a major biohazard is determined, the clones will be destroyed after the completion of the experiment rather than retaining them in the high containment facility. Other clones that are non-hazardous or not of major hazard will be retained in the high containment.

I–E. *Exemptions.* It must be emphasized that the following exemptions (*4*) are not meant to apply to experiments described in the Sections I–D–1 to I–D–5 as being prohibited. In addition, any recombinant DNA molecules involving DNA from Class 3 organisms (*1*) or cells known to be infected with these agents, or any recombinant DNA molecules which increase the virulence and host-range of a plant pathogen beyond that which occurs by natural genetic exchange, are not exempt unless specifically so designated by NIH under Section I–E–5.

The following recombinant DNA molecules are exempt from these Guidelines, and no registration with NIH is necessary:

I–E–1. Those that are not in organisms or viruses. (*5*)

I–E–2. Those that consist entriely of DNA segments from a single nonchromosomal or viral DNA source, though one or more of the segments may be a synthetic equivalent.

I–E–3. Those that consist entirely of DNA from a prokaryotic host, including its indigenous plasmids or viruses, when propagated only in that host (or a closely related strain of the same species) or when transferred to another host by well established physiological means; also those that consist entirely of DNA from a eukaryotic host, including its chloroplasts, mitochondria, or plasmids (but excluding viruses), when propagated only in that host (or a closely related strain of the same species).

I–E–4. Ceratin specified recombinant DNA molecules that consist entirely of DNA segments from different species that exchange DNA by known physiological processes, though one or more of the segments may be a synthetic equivalent. A list of such exchangers will be prepared and periodically revised by the Director, NIH, with advice of the RAC, after appropriate notice and opportunity for public comment. (See Section IV–E–1–b–(1)–(d).) Certain classes are exempt as of publication of these Revised Guidelines. The list is in Appendix A. An updated list may be obtained from the Office of Recombinant DNA Activities, National Institutes of Health, Bethesda, Maryland 20205.

I–E–5. Other classes of recombinant DNA molecules, if the Director, NIH, with advice of the RAC, after appropriate notice and opportunity for public comment, finds that they do not present a significant risk to health or the environment. (See Section IV–E–1–b–(1)–(d).) Certain classes are exempt as of publication of these Revised Guidelines. The list is in Appendix C. An updated list may be obtained from the Office of Recombinant DNA Activities; National Institutes of Health, Bethesda, Maryland, 20205.

I–F. *General Definitions.* See section IV–C.

II. Containment

Effective biological safety programs have been operative in a variety of laboratories for many years. Considerable information, therefore, already exists for the design of physical containment facilities and the selection of laboratory procedures applicable to organisms carrying recombinant DNAs. (*6–19*) The existing programs rely upon mechanisms that, for convenience, can be divided into two categories: (i) a set of standard practices that are generally used in microbiological laboratories, and (ii) special procedures, equipment, and laboratory installations that provide physical barriers which are applied in varying degrees according to the estimated biohazard.

Experiments on recombinant DNAs, by their very nature, lend themselves to a third containment mechanism—namely, the application of highly specific biological barriers. In fact, natural barriers do exist which limit either (i) the infectivity of a *vector*, or *vehicle*, (plasmid or virus) for specific hosts or (ii) its dissemination and survival in the environment. The vectors that provide the means for replication of the recombinant DNAs and/or the host cells in which they replicate can be genetically designed to decrease by many orders of magnitude the probability of dissemination of recombinant DNAs outside the laboratory.

As these three means of containment are complementary, different levels of containment appropriate for experiments with different recombinants can be established by applying various combinations of the physical and biological barriers along with a constant use of the standard practices. We consider these categories of containment separately here in order that such combinations can be conveniently expressed in the Guidelines.

In constructing these Guidelines, it was necessary to define boundary conditions for the different levels of physical and biological containment and for the classes of experiments to which they apply. We recognize that these definitions do not take into account all existing and anticipated information on special procedures that will allow particular experiments to be carried out under different conditions than indicated here without affecting risk. Indeed, we urge that individual investigators devise simple and more effective containment procedures and that investigators and institutuional biosafety committees recommend changes in the Guidelines to permit their use.

II–A. *Standard Practices and Training.* The first principle of containment is a strict adherence to good microbiological practices. (*6–15*) Consequently, all personnel directly or indirectly involved in experiments on recombinant DNAs must receive adequate instruction. (see Sections IV–D–1–g, IV–D–5–d and IV–D–8–b.). This shall, as a minimum, include instructions in aseptic techniques and in the biology of the organisms used in the experiments, so that the potential biohazards can be understood and appreciated.

Any research group working with agents with a known or potential biohazard shall have an emergency plan which describes the procedures to be followed if an accident contaminates personnel or the environment. The principal investigator must ensure that everyone in the laboratory is familiar with both the potential hazards of the

work and the emergency plan. (See Sections IV-D-5-e and IV-D-3-d.) If a research group is working with a known pathogen where there is an effective vaccine it should be made available to all workers. Where serological monitoring is clearly appropriate it shall be provide. (See Sections IV-D-1-h and IV-D-8-c.)

II-B. *Physical Containment Levels.* The objective of physical containment is to confine organisms containing recombinant DNA molecules, and thus to reduce the potential for exposure of the laboratory worker, persons outside of the laboratory, and the environment to organisms containing recombinant DNA molecules. Physical containment is achieved through the use of laboratory practices, containment equipment, and special laboratory design. Emphasis is placed on primary means of physical containment which are provided by laboratory practices and containment equipment. Special laboratory design provides a secondary means of protection against the accidental release of organisms outside the laboratory or to the environment. Special laboratory design is used primarily in facilities in which experiments of moderate to high potential hazards are performed.

Combinations of laboratory practices, containment equipment, and special laboratory design can be made to achieve different levels of physical containment. Four levels of physical containment, which are designated as P1, P2, P3, and P4, are described. It should be emphasized that the descriptions and assignments of physical containment detailed below are based on existing approaches to containment of pathogenic organisms. For example, the "Classification of Etiologic Agents on the Basis of Hazard,"(*7*) prepared by the Centers for Disease Control, describes four general levels which roughly correspond to our descriptions for P1, P2, P3, and P4; and the National Cancer Institute describes three levels for research on oncogenic viruses which roughly correspond to our P2, P3, and P4 levels.(*8*)

It is recognized that several different combinations of laboratory practices, containment equipment, and special laboratory design may be appropriate for containment of specific research activities. The Guidelines, therefore, allow alternative selections of primary containment equipment within facilities that have been designed to provide P3 and P4 levels of physical containment. The selection of alternative methods of primary containment is dependent, however, on the level of biological containment provided by the host-vector system used in the experiment. Consideration will also be given by the Director, NIH, with the advice of the Recombinant DNA Advisory Committee to other combinations which achieve an equivalent level of containment. (See Section IV-E-1-b-(2)-(b).) Additional material on physical containment for plant host-vector systems is found in Sections III-C-3 and III-C-4.

II-B-1. *P1 Level.*

II-B-1-a. *Laboratory Practices.*

II-B-1-a-(1). Laboratory doors shall be kept closed while experiments are in progress.

II-B-1-a-(2). Work surfaces shall be decontaminated daily, and immediately following spills of organisms containing recombinant DNA molecules.

II-B-1-a-(3). All biological wastes shall be decontaminated before disposal. Other contaminated materials, such as glassware, animal cages, and laboratory equipment, shall be decomtaminated before washing, reuse, or disposal.

II-B-1-a-(4). Mechanical pipetting devices shall be used; pipetting by mouth is prohibited.

II-B-1-a-(5). Eating, drinking, smoking, and storage of foods are not permitted in the laboratory area in which recombinant DNA materials are handled.

II-B-1-a-(6). Persons shall wash their hands after handling organisms containing recombinant DNA molecules and when they leave the laboratory.

II-B-1-a-(7). Care shall be taken in the conduct of all procedures to minimize the creation of aerosols.

II-B-1-a-(8). Contaminated materials that are to be decontaminated at a site away from the laboratory shall be placed in a durable leak-proof container, which is closed before removal from the laboratory.

II-B-1-a-(9). An insect and rodent control program shall be instituted.

II-B-1-a-(10). The use of laboratory gowns, coats, or uniforms is discretionary with the laboratory supervisor.

II-B-1-a-(11). Use of the hypodermic needle and syringe shall be avoided when alternative methods are available.

II-B-1-a-(12). The laboratory shall be kept neat and clean.

II-B-1-b. *Containment Equipment.* Special containment equipment is not required at the P1 level.

II-B-1-c. *Special Laboratory design.* Special laboratory design is not required at the P1 level.

II-B-2. *P2 Level.*

II-B-2-a. *Laboratory Practices.*

II-B-2-a-(1). Laboratory doors shall be kept closed while experiments are in progress.

II-B-2-a-(2). Work surfaces shall be decontaminated daily, and immediately following spills of organisms containing recombinant DNA molecules.

II-B-2-a-(3). All laboratory wastes shall be steam-sterilized (autoclaved) before disposal. Other contaminated materials such as glassware, animal cages, laboratory equipment, and radioactive wastes shall be decontaminated by a means demonstrated to be effective before washing, reuse, or disposal.

II-B-2-a-(4). Mechanical pipetting devices shall be used; pipetting by mouth is prohibited.

II-B-2-a-(5). Eating, drinking, smoking, and storage of food are not permitted in the laboratory area in which recombinant DNA materials are handled.

II-B-2-a-(6). Persons shall wash their hands after handling organisms containing recombinant DNA molecules and when they leave the laboratory.

II-B-2-a-(7). Care shall be exercised to minimize the creation of aerosols. For example, manipulations such as inserting a hot inoculating loop or needle into a culture, flaming an inoculation loop or needle so that it splatters, and forceful ejection of fluids from pipettes or syringes shall be avoided.

II-B-2-a-(8). Contaminated materials that are to be steam sterilized (autoclaved) or decontaminated at a site away from the laboratory shall be placed in a durable leak-proof container, which is closed before removal from the laboratory.

II-B-2-a-(9). Only persons who have been advised of the nature of the research being conducted shall enter the laboratory.

II-B-2-a-(10). The universal biohazard sign shall be posted on all laboratory access doors when experiments requiring P2 containment are in progress. Freezers and refrigerators or other units used to store organisms containing recombinant DNA molecules shall also be posted with the universal biohazard sign.

II-B-2-a-(11). An insect and rodent control program shall be instituted.

II-B-2-a-(12). The use of laboratory gowns, coats, or uniforms is required. Laboratory clothing shall not be worn to the lunch room or outside of the building in which the laboratory is located.

II-B-2-a-(13). Animals not related to the experiment shall not be permitted in the laboratory.

II-B-2-a-(14). Use of the hypodermic needle and syringe shall be avoided when alternative methods are available.

II-B-2-a-(15). The laboratory shall be kept neat and clean.

II–B–2–a–(16). Experiments of lesser biohazard potential can be carried out concurrently in carefully demarcated areas of the same laboratory.

II–B–2–b. *Containment Equipment.* Biological safety cabinets (20) shall be used to contain aerosol-producing equipment, such as blenders, lyophilizers, sonicators, and centrifuges, when used to process organisms containing recombinant DNA molecules, except where equipment design provides for containment of the potential aerosol. For example, a centrifuge may be operated in the open if a sealed head or safety centrifuge cups are used.

II–B–2–c. *Special Laboratory Design.* An autoclave for sterilization of wastes and contaminated materials shall be available in the same building in which organisms containing recombinant DNA molecules are used.

II–B–3. *P3 Level.*

II–B–3–a. *Laboratory Practices.*

II–B–3–a–(1). Laboratory doors shall be kept closed while experiments are in progress.

II–B–3–a–(2). Work surfaces shall be decontaminated following the completion of the experimental activity, and immediately following spills of organisms containing recombinant DNA molecules.

II–B–3–a–(3). All laboratory wastes shall be steam-sterilized (autoclaved) before disposal. Other contaminated materials, such as glassware, animal cages, laboratory equipment, and radioactive wastes, shall be decontaminated by a method demonstrated to be effective before washing, reuse, or disposal.

II–B–3–a–(4). Mechanical pipetting devices shall be used; pipetting by mouth is prohibited.

II–B–3–a–(5). Eating, drinking, smoking, and storage of food are not permitted in the laboratory area in which recombinant DNA materials are handled.

II–B–3–a–(6). Persons shall wash their hands after handling organisms containing recombinant DNA molecules and when they leave the laboratory.

II–B–3–a–(7). Care shall be exercised to minimize the creation of aerosols. For example, manipulations such as inserting a hot inoculating loop or needle into a culture, flaming an inoculation loop or needle so that it splatters, and forceful ejection of fluids from pipettes or syringes shall be avoided.

II–B–3–a–(8). Contaminated materials that are to be steam-sterilized (autoclaved) or decontaminated at a site away from the laboratory shall be placed in a durable leak-proof container, which is closed before removal from the laboratory.

II–B–3–a–(9). Entry into the laboratory shall be through a controlled access area. Only persons who have been advised of the nature of the research being conducted shall enter the controlled access area. Only persons required on the basis of program or support needs shall be authorized to enter the laboratory. Such persons shall be advised of the nature of the research being conducted before entry, and shall comply with all required entry and exit procedures.

II–B–3–a–(10). Persons under 16 years of age shall not enter the laboratory.

II–B–3–a–(11). The universal biohazard sign shall be posted on the controlled access area door and on all laboratory doors when experiments requiring P3-level containment are in progress. Freezers and refrigerators or other units used to store organisms containing recombinant DNA molecules shall also be posted with the universal biohazard sign.

II–B–3–a–(12). An insect and rodent control program shall be instituted.

II–B–3–a–(13). Laboratory clothing that protects street clothing (e.g., long-sleeve solid-front or wrap-around gowns; no-button or slipover jackets) shall be worn in the laboratory. Front-button laboratory coats are unsuitable. Laboratory clothing shall not be worn outside the laboratory and shall be decontaminated before it is sent to the laundry.

II–B–3–a–(14). Raincoats, overcoats, topcoats, coats, hats, caps, and such street outer-wear shall not be kept in the laboratory.

II–B–3–a–(15). Gloves shall be worn when handling materials requiring P3 containment. They shall be removed aseptically immediately after the handling procedure and decontaminated.

II–B–3–a–(16). Animals and plants not related to the experiment shall not be permitted in the laboratory.

II–B–3–a–(17). Vacuum outlets shall be protected by filter and liquid disinfectant traps.

II–B–3–a–(18). Use of hypodermic needle and syringe shall be avoided when alternative methods are available.

II–B–3–a–(19). The laboratory shall be kept neat and clean.

II–B–3–a–(20). If experiments involving other organisms which require lower levels of containment are to be conducted in the same laboratory concurrently with experiments requiring P3-level physical containment, they shall be conducted in accordance with all P3-level laboratory practices.

II–B–3–b. *Containment Equipment.*

II–B–3–b–(1) Biological safety cabinets (*20*) shall be used for all equipment and manipulations that produce aerosols—e.g., pipetting, dilutions, transfer operations, plating, flaming, grinding, blending, drying, sonicating, shaking, centrifuging—where these procedures involve organisms containing recombinant DNA molecules, except where equipment design provides for containment of the potential aerosol.

II–B–3–b–(2). Laboratory animals held in a P3 area shall be housed in partial-containment caging systems, such as Horsfall units (19A); open cages placed in ventilated enclosures, solid-wall and bottom cages covered by filter bonnets; or solid-wall and -bottom cages placed on holding racks equipped with ultraviolet radiation lamps and reflectors. (Note: Conventional caging systems may be used, provided that all personnel wear appropriate personal protective devices. These shall include, at a minimum, wrap-around gowns, head covers, gloves, shoe covers, and respirators. All personnel shall shower on exit from areas where these devices are required.)

II–B–3–b–(3). *Alternative Selection of Containment Equipment.*

Experimental procedures involving a host-vector system that provides a one-step higher level of biological containment than that specified in Part III can be conducted in the P3 laboratory using containment equipment specified for the P2 level of physical containment. Experimental procedures involving a host-vector system that provides a one-step lower level of biological containment than that specified in Part III can be conducted in the P3 laboratory using containment equipment specified for the P4 level of physical containment. Alternative combinations of containment safeguards are shown in Table I.

Table I.—*Combinations of Containment Safeguards*

Classification of experiment According to guidelines		Alternate combinations of physical and biological containment			
		Physical containment			
Physical containment	Biological containment	Laboratory design specified for—	Laboratory practices specified for—	Containment equipment specified for—	Biological containment
P3	HV3	P3	P3	P3	HV3
P3	HV3	P3	P3	P4	HV2
P3	HV2	P3	P3	P3	HV2
P3	HV2	P3	P3	P2	HV3

Table I.—*Combinations of Containment Safeguards*

Classification of experiment According to guidelines		Alternate combinations of physical and biological containment			
		Physical containment			
Physical containment	Biological [1] containment	Laboratory design specified for—	Laboratory practices specified for—	Containment equipment specified for—	Biological containment
P3	HV2	P3	P3	P4	HV1
P3	HV1	P3	P3	P3	HV1
P3	HV1	P3	P3	P2	HV2

[1] See Section II-D for decription of biological containment.

II–B–3–c. *Special Laboratory Design.*

II–B–3–c–(1). The laboratory shall be separated by a controlled access area from areas that are open to unrestricted traffic flow. A controlled access area is an anteroom, a change room, an air lock or any other double-door arrangement that separates the laboratory from areas open to unrestricted traffic flow.

II–B–3–c–(2). The surfaces of walls, floors, and ceilings shall be readily cleanable. Penetrations through these surfaces shall be sealed or capable of being sealed to facilitate space decontamination.

II–B–3–c–(3). A foot-, elbow-, or automatically-operated hand-washing facility shall be provided near each primary laboratory exit area.

II–B–3–c–(4). Windows in the laboratory shall be sealed.

II–B–3–c–(5). An autoclave for sterilization of wastes and contaminated materials shall be available in the same building (and preferably within the controlled laboratory area) in which organisms containing recombinant DNA molecules are used.

II–B–3–c–(6). The laboratory shall have a ventilation system that is capable of controlling air movement. The movement of air shall be from areas of lower contamination potential to areas of higher contamination potential (i.e., from the controlled access area to the laboratory area). If the ventilation system provides positive pressure supply air, the system shall operate in a manner that prevents the reversal of the direction of air movement or shall be equipped with an alarm that would be actuated in the event that reversal in the direction of air movement were to occur. The exhaust air from the laboratory area shall not be recirculated to other areas of the building unless the exhaust air is filtered by HEPA filters or equivalent. The exhaust air from the laboratory area can be discharged to the outdoors without filtration or other means for effectively reducing an accidental aerosol burden provided that it can be dispersed clear of occupied buildings and air intakes.

II–B–3–c–(7). The treated exhaust-air from Class I and Class II biological safety cabinets [*20*]may be discharged either to the laboratory or to the outdoors. The treated exhaust-air from a Class III cabinet shall be discharged directly to the outdoors. If the treated exhaust-air from these cabinets is to be discharged to the outdoors through a building exhaust air system, it shall be connected to this system so as to avoid any interference with the air balance of the cabinet and the building ventilation system.

II–B–4. *P4 Level.*

II–B–4–a. *Laboratory Practices.*

II–B–4–a–(1). Laboratory doors shall be kept closed while experiments are in progress.

II–B–4–a–(2). Work surfaces shall be decontaminated following the completion of the experimental activity and immediately following spills of organisms containing recombinant DNA molecules.

II–B–4–a–(3). All laboratory wastes shall be steam-sterilized (autoclaved) before disposal. Other contaminated materials such as glassware, animal cages, laboratory equipment, and radioactive wastes shall be decontaminated by a method demonstrated to be effective before washing, reuse, or disposal.

II–B–4–a–(4). Mechanical pipetting devices shall be used; pipetting by mouth is prohibited.

II–B–4–a–(5). Eating, drinking, smoking, and storage of food are not permitted in the P4 facility.

II–B–4–a–(6). Persons shall wash their hands after handling organisms containing recombinant DNA molecules and when they leave the laboratory.

II–B–4–a–(7). Care shall be exercised to minimize the creation of aerosols. For example, manipulations such as inserting a hot inoculating loop or needle into a culture, flaming an inoculation loop or needle so that it splatters, and forceful ejection of fluids from pipettes or syringes shall be avoided.

II–B–4–a–(8). Biological materials to be removed from the P4 facility in a viable or intact state shall be transferred to a nonbreakable sealed container, which is then removed from the P4 facility through a pass-through disinfectant dunk tank or fumigation chamber.

II–B–4–a–(9). No materials, except for biological materials that are to remain in a viable or intact state, shall be removed from the P4 facility unless they have been steam-sterilized (autoclaved) or decontaminated by a means demonstrated to be effective as they pass out of the P4 facility. All wastes and other materials as well as equipment not damaged by high temperature or steam shall be steam sterilized in the double-door autoclave of the P4 facility. Other materials which may be damaged by temperature or steam shall be removed from the P4 facility through a pass-through fumigation chamber.

II–B–4–a–(10). Materials within the Class III cabinets shall be removed from the cabinet system only after being steam-sterilized in an attached double-door autoclave or after being contained in a nonbreakable sealed container, which is then passed through a disinfectant dunk tank or a fumigation chamber.

II–B–4–a–(11). Only persons whose entry into the P4 facility is required to meet program or support needs shall be authorized to enter. Before entering, such persons shall be advised of the nature of the research being conducted and shall be instructed as to the appropriate safeguards to ensure their safety. They shall comply with instructions and all other required procedures.

II–B–4–a–(12). Persons under 18 years of age shall not enter the P4 facility.

II–B–4–a–(13). Personnel shall enter into and exit from the P4 facility only through the clothing change and shower rooms. Personnel shall shower at each egress from the P4 facility. Air locks shall not be used for personnel entry or exit except for emergencies.

II–B–4–a–(14). Street clothing shall be removed in the outer side of the clothing-change area and kept there. Complete laboratory clothing, including undergarments, head cover, shoes, and either pants and shirts or jumpsuits, shall be used by all persons who enter the P4 facility. Upon exit, personnel shall store this clothing in lockers provided for this purpose or discard it into collection hampers before entering the shower area.

II–B–4–a–(15). the universal biohazard sign is required on the P4 facility access doors and on all interior doors to individual laboratory rooms where experiments are conducted. The sign shall also be posted on freezers, refrigerators, or other units used to store organisms containing recombinant DNA molecules.

II–B–4–a–(16). An insect and rodent control program shall be instituted.

II–B–4–a–(17). Animals and plants not related to the experiment shall not be

permitted in the laboratory in which the experiment is being conducted.

II–B–4–a–(18). Vacuum outlets shall be protected by filter and liquid disinfectant traps.

II–B–4–a–(19). Use of the hypodermic needle and syringe shall be avoided when alternate methods are available.

II–B–4–a–(20). The laboratory shall be kept neat and clean.

II–B–4–a–(21) If experiments involving other organisms which require lower levels of containment are to be conducted in the P4 facility concurrently with experiments requiring P4–level containment, they shall be conducted in accordance with all P4–level laboratory practices specified in this section.

II–B–4–b. *Containment Equipment.*

II–B–4–b–(1). Experimental procedures involvong organisms that require P4-level physical containment shall be conducted either in (i) a Class III cabinet system or in (ii) Class I or Class II cabinets that are located in a specially designed area in which all personnel are required to wear one-piece positive-pressure isolation suits.

II–B–4–b–(2). Laboratory animals involved in experiments requiring P4-level physical containment shall be housed either in cages contained in Class III cabinets or in partial containment caging systems (such as Horsfall units [19A], open cages placed in ventilated enclosures, or solid-wall and -bottom cages covered by filter bonnets, or solid-well and -bottom cages placed on holding racks equipped with ultraviolet irradiation lamps and reflectors) that are located in a specially designed area in which all personnel are required to wear one-piece positive-pressure suits.

II–B–4–b–(3). *Alternative Selection of Containment Equipment.* Experimental procedures involving a host-vector system that provides a one-step higher level of biological containment than that specified in Part III can be conducted in the P4 facility using containment equipment requirements specified for the P3 level of physical containment. Alternative combinations of containment safeguards are shown in Table II

Table II.—*Combinations of Containment Safeguards*

Classification of experiment according to guidelines		Alternate combinations of physical and biological containment			
		Physical containment			Biological containment
Physical containment	Biological [1] containment	Laboratory design specified for—	Laboratory practices specified for—	Containment equipment specified for—	
P4	HV1	P4	P4	P4	HV1
P4	HV1	P4	[2]P4	P3	HV2

[1] See Section II–D for description of biological containment.
[2] In this case gloves shall be worn, in addition to the clothing requirements specified in II–B–4–a–(14).

II–B–4–c. *Special Laboratory Design.*

II–B–4–c–(1). The laboratory shall be located in a restricted-access facility which is either a separate building or a clearly demarcated and isolated zone within a building. Clothing-change areas and shower rooms shall be provided for personnel entry and egress. These rooms shall be arranged so that personnel leave through the shower area to the change room. A double-door ventilated vestibule or ultraviolet air lock shall be provided for passage of materials, supplies, and equipment which are not brought into the P4 facility through the change room area.

II–B–4–c–(2). Walls, floors, and ceilings of the P4 facility are constructed to form an internal shell which readily allows vapor-phase decontamination and is animal- and insect-proof. All penetrations through these structures and surfaces ar sealed. (The integrity of the walls, floors, ceilings, and penetration seals should ensure adequate containment of a vapor-phase decontaminant under static pressure conditions. This requirement does not imply that these surfaces must be airtight.)

II–B–4–c–(3). A foot-, elbow-, or automatically-operated handwashing facility shall be provided near the door within each laboratory in which experiments involving recombinant DNA are conducted in openface biological safety cabinets.

II–B–4–c–(4). Central vacuum systems are permitted. The system, if provided, shall not serve areas outside the P4 facility. The vacuum system shall include in-line HEPA filters near each use point or service cock. The filters shall be installed so as to permit in-place decontamination and replacement. Water supply, liquid and gaseous services provided to the P4 facility shall be protected by devices that prevent backflow.)

II–B–4–c–(5). Drinking water fountains shall not be installed in laboratory or animal rooms of the P4 facility. Foot-operated water fountains are permitted in the corridors of the P4 facility. The water service provided to such fountains shall be protected from the water services to the laboratory areas of the P4 facility.

II–B–4–c–(6). Laboratory doors shall be self-closing.

II–B–4–c–(7). A double-door autoclave shall be provided for sterilization of material passing out of the P4 facility. The autoclave doors shall be interlocked so that both doors will not be open at the same time.

II–B–4–c–(8). A pass-through dunk tank or fumigation chamber shall be provided for removal from the P4 facility of material and equipment that cannot be heat-sterilized.

II–B–4–c–(9). All liquid effluents from the P4 facility shall be collected and decontaminated before disposal. Liquid effluents from biological safety cabinets and laboratory sinks shall be sterilized by heat. Liquid effluents from the shower and hand washing facilities may be activated by chemical treatment. HEPA filters shall be installed in all vents from effluent drains.

II–B–4–c–(10). An individual supply and exhaust-air ventilation system shall be provided. The system shall maintain pressure differentials and directional air flow as required to ensure inflow from areas outside the facility toward areas of highest potential risk within the facility. The system shall be designed to prevent the reversal of air flow. The system shall sound an alarm in the event of system malfunction.

II–B–4–c–(11). Air within individual laboratories of the P4 facility may be recirculated if HEPA filtered.

II–B–4–c–(12). The exhaust air from the P4 facility shall be HEPA filtered and discharged to the outdoors so that it is dispersed clear of occupied buildings and air intakes. The filter chambers shall be designed to allow *in situ* decontamination before removal and to facilitate certification testing after replacement.

II–B–4–c–(13). The treated exhaust-air from Class I and Class II biological safety cabinets(*20*) may be discharged directly to the laboratory room environment or to the outdoors. The treated exhaust-air from Class III cabinets shall be discharged to the outdoors. If the treated exhaust-air from these cabinets is to be discharged to the outdoors through the P4 facility exhaust

air system, it shall be connected to this system so as to avoid any interference with the air balance of the cabinets of the facility exhaust air system.

II–B–4–c–(14). As noted in Section II–B–4–b–(1), the P4 facility may contain specially designed areas in which all personnel are required to wear one-piece positive-pressure isolation suits. Such areas shall be airtight. The exhaust-air from the suit area shall be filtered by two sets of HEPA filters installed in series, and a duplicate filtration unit and exhaust fan shall be provided. The air pressure within the suit area shall be less than that in any adjacent area. An emergency lighting system, communication systems, and power source shall be provided. A double-door autoclave shall be provided for sterilization of all waste materials to be removed from the suit area.

Personnel who enter this area shall wear a one-piece positive-pressure suit that is ventilated by a life-support system. The life-support system shall be provided with alarms and emergency backup air. Entry to this area is through an airlock fitted with airtight doors. A chemical shower area shall be provided to decontaminate the surfaces of the suit before removal.

II–C. *Shipment.* Recombinant DNA molecules contained in an organism or virus shall be shipped only as an etiologic agent under requirements of the U.S. Public Health Service, and the U.S. Department of Transportation (§ 72.25, Part 72, Title 42, and §§ 173.386–.388, Part 173, Title 49, U.S. Code of Federal Regulations (CFR)) as specified below:

II–C–1. Recombinant DNA molecules contained in an organism or virus requiring P1, P2, or P3 physical containment, when offered for transportation or transported, are subject to all requirements of § 72.25(c)(1—(5), Part 72, Title 42 CFR, and §§ 173.386–.388, Part 173, Title 49 CFR.

II–C–2. Recombinant DNA molecules contained in an organism or virus requiring P4 physical containment, when offered for transportation or transported, are subject to the requirements listed above under II–C–1 and are also subject to § 72.25(c)(6), Part 72, Title 42 CFR.

II–C–3. Additional information on packaging and shipment is given in the "Laboratory Safety Monograph—A Supplement to the NIH Guidelines for Recombinant DNA Research."

II–D. *Biological Containment.*

II–D–1. *Levels of Biological Containment.* In consideration of biological containment, the vector (plasmid, organelle, or virus) for the recombinant DNA and the host (bacterial, plant, or animal cell) in which the vector is propagated in the laboratory will be considered together. Any combination of vector and host which is to provide biological containment must be chosen or constructed so that the following types of "escape" are minimized: (i) survival of the vector in its host outside the laboratory and (ii) transmission of the vector from the propagation host to other nonlaboratory hosts.

The following levels of biological containment (HV, or *Host-Vector*, systems) for prokaryotes will be established; specific criteria will depend on the organisms to be used. Eukaryotic host-vector systems are considered in Part III.

II–D–1–a. *HV1.* A host-vector system which provides a moderate level of containment. *Specific systems:*

II–D–1–a–(1). *EK1.* The host is always *E. coli* K–12 or a derivative thereof, and the vectors include nonconjugative plasmids (e.g., pSC101, ColE1, or derivatives thereof [*21–27*]) and variants of bacteriophage, such as lambda [*28–33*]). The *E. coli* K–12 hosts shall not contain conjugation-proficient plasmids, whether autonomous or integrated, or generalized transducing phages, except as specified in Section III–0.

II–D–1–a–(2). *Other Prokaryotes.* Hosts and vectors shall be, at a minimum, comparable in containment to *E. coli* K–12 with a non conjugative plasmid or bacteriophage vector. The data to be considered and a mechanism for approval of such HV1 systems are described below (Section II—D–2).

II–D–1–b. *HV2.* These are host-vector systems shown to provide a high level of biological containment as demonstrated by data from suitable tests performed in the laboratory. Escape of the recombinant DNA either via survival of the organisms or via transmission of recombinant DNA to other organisms should be less than $1/10^8$ under specified conditions. *Specific systems:*

II–D–1–b–(1). For EK2 host-vector systems in which the vector is a plasmid, no more than one in 10^8 host cells should be able to perpetuate a cloned DNA fragment under the specified nonpermissive laboratory conditions designed to represent the natural environment, either by survival of the original host or as a consequence of transmission of the cloned DNA fragment.

II–D–1–b–(2). For EK2 host-vector systems in which the vector is a phage, no more than one in 10^6 phage particles should be able to perpetuate a cloned DNA fragment under the specified nonpermissive laboratory conditions designed to represent the natural environment either (i) as a prophage (in the inserted or plasmid form) in the laboratory host used for phage propagation or (ii) by surviving in natural environments and transferring a cloned DNA fragment to other hosts (or their resident prophages).

II–D–1–c. *HV3.* These are host-vector systems in which:

II–D–1–c–(1). All HV2 criteria are met.

II–D–1–c–(2). The vector is dependent on its propagation host or is highly defective in mobilizability. Reversion to host-independence must be less than $1/10^8$ per vector genome per generation.

II–D–1–c–(3). No markers conferring resistance to antibiotics commonly used clinically or in agriculture are carried by the vector, unless expression of such markers is dependent on the propagating host or on unique laboratory-controlled conditions or is blocked by the inserted DNA.

II–D–1–c–(4). The specified containment shown by laboratory tests has been independently confirmed by specified tests in animals, including primates, and in other relevant environments.

II–D–1–c–(5). The relevant genotypic and phenotypic traits have been independently confirmed.

II–D–2. *Certification of Host-Vector Systems.*

II–D–2–a. *Responsibility.* HV1 systems other than *E. coli* K–12, and HV2 and HV3 host-vector systems, may not be designated as such until they have been certified by the director, NIH. Application for certification of a host-vector system is made by written application to the Office of Recombinant DNA Activities, National Institutes of Health, Bethesda, Maryland 20205.

Host-vector systems that are proposed for certification will be reviewed by the National Institutes of Health (NIH) Recombinant DNA Advisory Committee (RAC). (See Section IV–E–1–b–(1)–(c).) This will first involve review of the data on construction, properties, and testing of the proposed host-vector system by a Working Group composed of one or more members of the RAC and other persons chosen because of their expertise in evaluating such data. The Committee will then evaluate the report of the Working Group and any other available information at a regular meeting. The Director, NIH, is responsible for certification after receiving the advice of the RAC. Minor modifications of existing certified host-vector systems, where the modifications are of minimal or no consequence to the properties relevant to containment may be certified by the Director, NIH.

without review by the RAC. (See Section IV–E–1–b–(3)–(f).)

When new host-vector systems are certified, notice of the certification will be sent by the Office of Recombinant DNA Activities (ORDA) to the applicant and to all Institutional Biosafety Committees (IBCs) and will be published in the *Recombinant DNA Technical Bulletin.* Copies of a list of all currently certified host-vector systems may be obtained from ORDA at any time.

The Director, NIH, may at any time rescind the certification of any host-vector system. (See Section IV–E–1–b–(3)–(i).) If certification of a host-vector system is rescinded, NIH will instruct investigators to transfer cloned DNA into a different system, or use the clones at a higher physical containment level unless NIH determines that the already constructed clones incorporate adequate biological containment.

Certification of a given system does not extend to modifications of either the host or vector component of that system. Such modified systems must be independently certified by the Director, NIH. If modifications are minor, it may only be necessary for the investigator to submit data showing that the modifications have either improved or not impaired the major phenotypic traits on which the containment of the system depends. Substantial modifications of a certified system require the submission of complete testing data.

II–D–2–b. *Data To Be Submitted for Certification.*

II–D–2–b–(1). *HV1 Systems Other than E. Coli K–12.* The following types of data shall be submitted, modified as appropriate for the particular system under consideration: (i) A description of the organism and vector; the strain's natural habitat and growth requirements; its physiological properties, particularly those related to its reproduction and survival and the mechanisms by which it exchanges genetic information; the range of organisms with which this organism normally exchanges genetic information and what sort of information is exchanged; and any relevant information on its pathogenicity or toxicity. (ii) A description of the history of the particular strains and vectors to be used, including data on any mutations which render this organism less able to survive or transmit genetic information. (iii) A general description of the range of experiments contemplated, with emphasis on the need for developing such an HV1 system.

II–D–2–b–(2). *HV2 Systems.* Investigators planning to request HV2 certification for host-vector systems can obtain instructions from ORDA concerning data to be submitted (*33A, 33B*). In general, the following types of data are required: (i) Description of construction steps, with indication of source, properties, and manner of introduction of genetic traits. (ii) Quantitative data on the stability of genetic traits that contribute to the containment of the system. (iii) Data on the survival of the host-vector system under nonpermissive laboratory conditions designed to represent the relevant natural environment. (iv) Data on transmissibility of the vector and/or a cloned DNA fragment under both permissive and nonpermissive conditions. (v) Data on all other properties of the system which affect containment and utility, including information on yields of phage or plasmid molecules, ease of DNA isolation, and ease of transfection or transformation. (vi) In some cases, the investigator may be asked to submit data on survival and vector transmissibility from experiments in which the host-vector is fed to laboratory animals (e.g., rodents). Such *in vivo* data may be required to confirm the validity of predicting *in vivo* survival on the basis of *in vitro* experiments.

Data must be submitted in writing to ORDA. Ten to twelve weeks are normally required for review and circulation of the data prior to the meeting at which such data can be considered by the RAC. Investigators are encouraged to publish their data on the construction, properties, and testing of proposed HV2 systems prior to consideration of the system by the RAC and its subcommittee. More specific instructions concerning the type of data to be submitted to NIH for proposed EK2 systems involving either plasmids or bacteriophage λ in *E. coli* K–12 are available from ORDA.

II–D–2–b–(3). *HV3 Systems.* Putative HV3 systems must, as the first step in certification, be certified as HV2 systems. Systems which meet the criteria given above under II–D–1–(c)–1, II–D–1–(c)–2, and II–D–1–(c)–3 will then be recommended for HV3 testing. Tests to evaluate various HV2 host-vector systems for HV3 certification will be performed by contractors selected by NIH. These contractors will repeat tests performed by individuals proposing the HV2 system and, in addition, will conduct more extensive tests on conditions likely to be encountered in nature. The genotypic and phenotypic traits of HV2 systems will be evaluated. Tests on survival and transmissibility in and on animals, including primates, will be performed, as well as tests on survival in certain specified natural environments.

II–D–3. *Distribution of Certified Host-Vectors.* Certified HV2 and HV3 host-vector systems (plus appropriate control strains) must be obtained from the NIH or its designees, one of whom will be the investigator who developed the system. NIH shall announce the availability of the system by publication of notices in appropriate journals.

Plasmid vectors will be provided in a suitable host strain, and phage vectors will be distributed as small-volume lysates. If NIH propagates any of the host strains or phage, a sample will be sent to the investigator who developed the system or to an appropriate contractor, prior to distribution, for verification that the material is free from contamination and unchanged in phenotypic properties.

In distributing the certified HV2 and HV3 host-vector systems, NIH or its designee will (i) send out a complete description of the system; (ii) enumerate and describe the tests to be performed by the user in order to verify important phenotypic traits; (iii) remind the user that any modification of the system necessitates independent approval of the system by the NIH; and (iv) remind the user of responsibility for notifying ORDA of any discrepancies with the reported properties or any problems in the safe use of the system.

NIH may also distribute certified HV1 host-vector systems.

III. Containment Guidelines for Covered Experiments

Part III discusses experiments covered by the Guidelines. The reader must first consult Part I, where listings are given of prohibited and exempt experiments.

Containment guidelines for permissible experiments are given in Part III. For these experiments no registration with the National Institutes of Health (NIH) is necessary. However, for these experiments, prior to their initiation, investigators must submit to their Institutional Biosafety Committee (IBC) a registration document that contains a description of (a) the source(s) of DNA, (b) the nature of the inserted DNA sequences, (c) the hosts and vectors to be used, (d) whether a deliberate attempt will be made to obtain expression of a foreign gene in the cloning vehicle and if so, what protein, and (e) the containment conditions specified by these Guidelines. This registration document must be dated and signed by the investigator and filed only with the local IBC. The IBC shall review all such proposals. IBC review prior to initiation

of the experiment is not required for most experiments described in Section III–O. Prior IBC review is required for all other experiments described in the subsections of Part III.

Changes from the levels specified in Part III for specific experiments (or the assignment of levels to experiments not explicitly considered here) may not be instituted without the express approval of the Director, NIH. (See Sections IV–E–1–b–(1)–(a), IV–E–1–b–(1)–(b), IV–E–1–b–(2)–(b), IV–E–1–b–(2)–(c), and IV–E–1–b–(3)–(b).)

In the classification of containment criteria for different kinds of recombinant DNAs, the stated levels of physical and biological containment are minimal for the experiments designated. The use of higher levels of biological containment (HV3<HV2<HV1) is encouraged if they are available and equally appropriate for the purposes of the experiment.

III–O. *Classification of Experiments Using E. coli K–12 and Saccharomyces cerevisiae Host-Vector Systems.* Most recombinant DNA experiments currently being done employ *E. coli* K–12 host-vector systems; others employ the *S. cerevisiae* host-vector systems. These are the systems for which we have the most experience and knowledge.

Some experiments using *E. coli* K–12 and *S. cerevisiae* host-vector systems and prohibited (see Section I–D).

Some experiments using *E. coli* K–12 and *S. cerevisiae* host-vector systems are exempt from the Guidelines (see Section I–E).

Experiments using *E. coli* K–12 host-vector systems and DNA from Class 3 organisms [1] or from cells known to be infected with these agents will be conducted at P3 containment or at a lower level as specified by NIH (See Section IV–E–1–b–2–(e)).

Other experiments using *E. coli* K–12 or laboratory strains of *S. cerevisiae* shall use P1 physical containment and, except as specified in the last paragraph of this section, an HV1 host-vector system [i.e., for experiments using *E. coli* K–12 (a) the *E. coli* host shall not contain conjugation-proficient plasmids or generalized transducing phages, and (b) lambda or lambdoid or Ff bacteriophages or non-conjugative plasmids [49] shall be used as vectors. For experiments in *S. cerevisiae*, laboratory strains shall be used]. For these experiments review by the IBC prior to the initiation of the experiment is not required. An exception, however, which does require prior review and approval by the IBC is any experiment in which there is a deliberate attempt to have the *E. coli* K–12 efficiently express as a protein product the information carried in any gene derived from a eukaryotic organism or from any virus or viroid which infects a eukaryotic organism.

Experiments involving the insertion into *E. coli* K–12 of DNA from prokaryotes that exchange genetic information with *E. coli* by known physiological processes will be exempted from these Guidelines if they appear on the "list of exchangers" set forth in Appendix A (see Section I–E–4).

For those not on the Appendix A list but which exchange genetic information (*35*) with *E. coli*, experiments may be performed with any *E. coli* K–12 vector (e.g., conjugative plasmid). When a non-conjugative vector is used, the *E. coli* K–12 host may contain conjugation-proficient plasmids, either autonomous or integrated, or generalized transducing phages.

III–O–1. *Experiments Involving Class 3 Organisms.* Experiments involving recombinant DNA from Class 3 organisms (*1*) or from cells known to be infected with these agents may be conducted at P3 containment in *E. coli* K–12 EK1 hosts (see Section III–O). Containment levels for all other experiments with Class 3 organisms or with recombinant DNA which increases the virulence and host range of a plant pathogen beyond that which occurs by natural genetic exchange will be determined by NIH. (See Section (IV–E–1–b–2–(e)).

III–A. *Classification of Experiments Using Certain HV1 and HV2 Host-Vector Systems.* Certain HV1 and HV2 host-vector systems are assigned containment levels as specified in the subsections of this Section III–A. Those so classified as of publication of these revised Guidelines are listed in Appendix D. An updated list may be obtained from the Office of Recombinant DNA Activities, National Institutes of Health, Bethesda, Maryland 20205.

III–A–1. *Shotgun Experiments.* These experiments involve the production of recombinant DNAs between the vector and portions of the specified cellular source, preferably a partially purified fraction. Care should be taken either to preclude or eliminate contaminating microoganisms before isolating the DNA.

III–A–1–a. *Eukaryotic DNA Recombinants.*

III–A–1–a–(1). *Primates.* P2 physical containment + an HV2 host-vector or P3 + HV1.

III–A–1–a–(2). *Other Mammals.* P2 physical containment + an HV2 host-vector or P3 + HV1.

III–A–1–a–(3). *Birds.* P2 physical containment + an HV2 host-vector, or P3 + HV1.

III–A–1–a–(4). *Cold-Blooded Vertebrates.* P2 physical containment + an HV1 host-vector or P1 + HV2. If the eukaryote is known to produce a potent polypeptide toxin, (*34*) the containment shall be increased to P3 + HV2.

III–A–1–a–(5). *Other Cold-Blooded Animals and Lower Eukaryotes.* This large class of eukaryotes is divided into two groups:

III–A–1–a–(5)–a. Species that are known to produce a potent polypeptide toxin (*34*) that acts in vertebrates, or are known pathogens listed in Class 2, (*1*) or are known to carry such pathogens must use P3 physical containment + an HV2 host-vector. When the potent toxin is not a polypeptide and is likely not to be the product of closely linked eukaryote genes, containment may be reduced to P3+HV1 or P2+HV2. Species that produce potent toxins that affect invertebrates or plants but not vertebrates require P2+HV2 or P3+HV1. Any species that has a demonstrated capacity for carrying particular pathogenic microorganisms is included in this group, unless the organisms used as the source of DNA have been shown not to contain those agents, in which case they may be placed in the following group. (*2A*)

III–A–1–a–(5)–(b). The remainder of the species in this class including plant pathogenic or symbiotic fungi that do not produce potent toxins: P2+HV1 or P1+HV2. However, any insect in this group must be either (i) grown under laboratory conditions for at least 10 generations prior to its use as a source of DNA, or (ii) if caught in the wild, must be shown to be free of disease-causing microorganisms or must belong to a species that does not carry microorganisms causing disease in vertebrates or plants. (*2A*) If these conditions cannot be met, experiments must be done under P3+HV1 or P2+HV2 containment.

III–A–1–a–(6). *Plants.* P2 physical containment + an HV1 host-vector, or P1+HV2. If the plant source makes a potent polypeptide toxin, (*34*) the containment must be raised to P3 physical containment + HV2 host-vector. When the potent toxin is not a polypeptide and is likely not to be the product of closely linked plant genes, containment may be reduced to P3+HV1 or P2+HV2. (*2A*)

III–A–1–b. *Prokaryotic DNA Recombinants.* P2+HV1 or P1+HV2 for experiments with phages, plasmids and DNA from nonpathogenic prokaryotes which do not produce polypeptide toxins. (*34*) P3+HV2 for experiments

with phages, plasmids and DNA from Class 2 agents. (*1*)

III–A–2–a. *Viruses of Eukaryotes* (summary given in Table III; see also exception given at asterisk at end of Appendix D).

III–A–2–a–(1). *DNA Viruses.*

III–A–2–a–(1)–(a). *Nontransforming viruses.*

III–A–2–a–(1)–(a)–(*1*). *Adeno-Associated Viruses, Minute Virus of Mice, Mouse Adenovirus (Strain FL, and Plant Viruses. (48)* P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with (i) the whole viral genome, (ii) subgenomic DNA segments, or (iii) purified cDNA copies of viral mRNA. (*37*)

III–A–2–a–(1)–(a)–(*2*). *Hepatitis B.*

III–A–2–a–(1)–(a)–(*2*)–(*a*). P1 physical containment + an HV1 host-vector shall be used for purified subgenomic DNA segments. (*38*)

III–A–2–a–(1)–(a)–(*2*)–(*b*). P2 physical containment + an HV2 host-vector, or P3 + HV1, shall be used for DNA recombinants produced with the whole viral genome or with subgenomic segments that have not been purified to the extent required in footnote 38.

III–A–2–a–(1)–(a)–(*2*)–(*c*). P2 physical containment + an HV1 host-vector shall be used for DNA recombinants derived from purified cDNA copies of viral mRNA.(*37*)

III–A–2–a–(1)–(a)–(*3*). *Other Nontransforming Member of Presently Classified Viral Families.(36)*

III–A–2–a–(1)–(a)–(*3*)–(*a*). P1 physical containment + an HV1 host-vector shall be used for (i) DNA recombinants produced with purified subgenomic DNA(*38*) segments or (ii) purified cDNA copies of viral mRNA.(*37*)

III–A–2–a–(1)–(a)–(*3*)–(*b*). P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with the whole viral genome or with subgenomic segments that have not been purified to the extent required in footnote 38.

III–A–2–a–(1)–(b). *Transforming Viruses.(37A)*

III–A–2–a–(1)–(b)–(*1*). *Herpes Saimiri, Herpes Ateles, and Epstein Barr Virus.(39)*

III–A–2–a–(1)–(b)–(*1*)–(*a*). P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with purified nontransforming subgenomic DNA segments.(*38*)

III–A–2–a–(1)–(b)–(*1*)–(*b*). P2 physical containment + an HV1 host-vector shall be used for (i) DNA recombinants produced with purified subgenomic DNA segments containing an entire transforming gene(*38*) or (ii) purified cDNA copies of viral mRNA.(*37*)

III–A–2–a–(1)–(b)–(*1*)–(*c*). P3 physical containment + an HV1 host-vector, or P2 + HV2, shall be used for DNA recombinants produced with the whole viral genome or with subgenomic segments that have not been purified to the extent required in footnote 38.

III–A–2–a–(1)–(b)–(*2*). *Other Transforming Members of Presently Classified Viral Families.(36)*

III–A–2–a–(1)–(b)–(*2*)–(*a*). P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with purified nontransforming subgenomic DNA segments(*38*)

III–A–2–a–(1)–(b)–(*2*)–(*b*). P2 physical containment + an HV1 host-vector shall be used for (i) DNA recombinants produced with the whole viral genome, (ii) subgenomic DNA segments containing an entire transforming gene, (iii) purified cDNA copies of viral mRNA.(*37*) or (iv) subgenomic segments that have not been purified to the extent required in footnote 38.

III–A–2–a–(2). *DNA Transcripts of RNA Viruses.*

III–A–2–a–(2)–(a). *Retroviruses.*

III–A–2–a–(2)–(a)–(*1*). *Gibbon Ape, Woolly Monkey, Feline Leukemia and Feline Sarcoma Viruses.(39)*

III–A–2–a–(2)–(a)–(*1*)–(*a*). P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with purified nontransforming subgenomic DNA segments.(*38*)

III–A–2–a–(2)–(a)–(*1*)–(*b*). P2 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with purified subgenomic DNA segments.(*38*) containing an entire transforming gene.

III–A–2–a–(2)–(a)–(*1*)–(*c*). P2 physical containment + an HV2 host-vector, or P3 + HV1, shall be used for DNA recombinants produced with (i) the whole viral genome, (ii) purified cDNA copies of viral mRNA.(*37*) or (iii) subgenomic segments that have not been purified to the extent required in footnote 38.

III–A–2–a–(2)–(a)–(*2*). *Other Members of the Family Retroviridiae.(36)*

III–A–2–a–(2)–(a)–(*2*)–(*a*). P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with purified nontransforming subgenomic DNA segments.(*38*)

III–A–2–a–(2)–(a)–(*2*)–(*b*). P2 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with (i) subgenomic DNA segments containing an entire transforming gene, (ii) the whole viral genome, or (iii) purified cDNA copies of viral mRNA, (*37*) or (iv) subgenomic segments that have not been purified to the extent required in footnote 38.

III–A–2–a–(2)–(b). *Negative Strand RNA Viruses.* P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with (i) cDNA copies of the whole genome, (ii) subgenomic cDNA segments, or (iii) purified cDNA copies of viral mRNA. (*37*)

III–A–2–a–(2)–(c). *Plus-Strand RNA Viruses.*

III–A–2–a–(2)–(c)–(*1*). *Types 1 and 2 Sabin Poliovirus Vaccine Strains and Strain 17D (Theiler) of Yellow Fever Virus.* P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with (i) cDNA copies of the whole viral genome, (ii) subgenomic cDNA segments, or (iii) purified cDNA copies of viral mRNA. (*37*)

III–A–2–a–(2)–(c)–(*2*). *Other Plus-Strand RNA Viruses Belonging to Presently Classified Viral Families. (36)*

III–A–2–a–(2)–(c)–(*2*)–(*a*). P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with purified subgenomic cDNA segments. (*38*)

Table III.—*Recommended Containment for Cloning of Viral DNA or cDNA in Certain HV1 and HV2 Systems Specified in Appendix D*

[See text for full details]

Virus class	Type of viral DNA segment to be cloned				
	Subgenomic [38]		Genomic[1]		cDNA from viral mRNA [37]
	Non-transforming segment	Segment containing an entire transforming gene	Nonsegmented genome	Segmented genome	
DNA:					
Nontransforming viruses:					
AAV, MVM, mouse adeno (strain FL)	P1+HV1	.....	P1+HV1	.....	P1+HV1
Plant viruses	P1+HV1	.....	P1+HV1	.....	P1+HV1
Hepatitis B	P1+HV1[38]	.....	P2+HV2 or P3+HV1	.....	P2+HV1
Other	P1+HV1[38]	.....	P1+HV1	.....	P1+HV1
Transforming viruses:					
Herpes Saimiri, H. Ateles and EBV [39]	P1+HV1[38]	P2+HV1	P2+HV2 or P3+HV1	.....	P2+HV1

Table III.—*Recommended Containment for Cloning of Viral DNA or cDNA in Certain HV1 and HV2 Systems Specified in Appendix D*—Continued

[See text for full details]

Virus class	Type of viral DNA segment to be cloned				
	Subgenomic [38]		Genomic[1]		cDNA from viral mRNA [37]
	Non-transforming segment	Segment containing an entire transforming gene	Nonsegmented genome	Segmented genome	
Other	P1+HV1[38]	P2+HV1	P2+HV1	.....	P2+HV1
RNA:					
Retroviruses:					
Gibbon ape, wooly monkey FeLV and FeSV [39].	P1+HV1[38]	P2+HV1	P2+HV2 or P3+HV1	.....	P2+HV2 or P3+HV1
Other	P1+HV1[38]	P2+HV1	P2+HV1	.....	P2+HV1
Negative-Strand RNA	P1+HV1	.....	P1+HV1	P1+HV1	P1+HV1
Plus-Strand RNA:					
Types 1 and 2 Sabin polio, 17D yellow fever vaccine strains.	P1+HV1	.....	P1+HV1	.....	P1+HV1
Other	P1+HV1[38]	.....	P2+HV1	.....	P2+HV1
Double-stranded RNA	P1+HV1	.....	.....	P1+HV1	P1+HV1
Plant viruses+viroids	P1+HV1	.....	P1+HV1	P1+HV1	P1+HV1
Intracellular viral DNA	[2]	[2]	[2]	.....	

[1] See exception given at asterisk at end of appendix D.
[2] See text.

III–A–2–a–(2)–(c)–(*2*)–(*b*). P2 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with (i) cDNA copies of the whole genome, or (ii) purified cDNA copies of viral mRNA.*(37)*

III–A–2–a–(2)–(d). *Double-Stranded Segmented RNA Viruses.* P1 physical containment + an HV1 host-vector shall be used for DNA recombinants produced with (i) mixtures of subgenomic cDNA segments, (ii) a specific subgenomic cDNA segment, or (iii) purified cDNA copies of viral mRNA.*(37)*

III–A–2–a–(2)–(e). *RNA Plant Viruses and Plant Viroids.* (*48*) P1l physical containment + an HV1 host-vector shall be used for DNA recombinants produced with (i) cDNA copies of the whole viral genome, (ii) subgenomic cDNA segments, or (iii) purified cDNA copies of viral mRNA.*(37)*

III–A–2–a–(3). *Intracellular Viral DNA.* Physical and biological containment specified for shotgun experiments with eukaryotic cellular DNA [see Section III–A–(1)–(a)] shall be used for DNA recombinants produced with integrated viral DNA or viral genomes present in infected cells.

III–A–2–b. *Eukaryotic Organelle DNAs.* P2 phycial containment + an HV1 host-vector, or P1l + HV2, for mitochondrial or chloroplast DNA from eukaryotes when the organelle DNA has been obtained from isolated organelles. Otherwise, the conditions given for shotgun experiments apply.

III–A–2–c. *Prokaryotic Plasmid and Phage DNAs.* The containment levels required for shotgun experiments with DNA from prokaryotes apply to their plasmids or phages (See Section III–A–1–b.)

III–A–3. *Lowering of Containment Levels for Characterized or Purified DNA Preparations and Clones.* Many of the risks which might conceivably arise from some types of recombinant DNA experiments, particularly shotgun experiments, would result from the inadvertent cloning of a harmful sequence. Therefore, in cases where the risk of inadvertently cloning the "wrong" DNA is reduced by prior enrichment for the desired piece, or in which a clone made from a random assortment of DNAs has been purified and the absence of harmful sequences established, the containment conditions for further work may be reduced. The following section outlines the mechanisms for such reductions.

III–A–3–a. *Purified DNA Other than Plasmids, Bacteriophages, and Other Viruses.* The formation of DNA recombinants from ceilular DNAs that have been purified (*41*) and in which the absence of harmful sequences has been established (*3*) can be carried out under lower containment conditions than used for the corresponding shotgun experiment.(*42*). The containment may be decreased one step in physical containment (P4+P3; P3+P2; P2+P1) while maintaining the biological containment specified for the shotgun experiment, or one step in biological containment (HV3+HV2; HV2+HV1) while maintaining the specified physical containment. The Institutional Biosafety Committee (IBC) must review such a reduction and the approval of the IBC and of the NIH must be secured before such a reduction may be put into effect. IBC approval is sufficient for such a reduction except for any lowering of containment under Section III–A–3–a to levels below P1+HV1, which requires prior NIH approval. (See Section IV–E–1–b–(3)–(e).)

III–A–3–b. *Characterized Clones of DNA Recombinants.* When a cloned DNA recombinant has been rigorously characterized and the absence of harmful sequences has been established (*3*) experiments involving this recombinant DNA may be carried out under lower containment conditions. Institutional Biosafety Committees (IBCs) may give approval for a single-step reduction in physical or biological containment on receipt of evidence of characterization of a clone derived from a shotgun experiment and its probable freedom from harmful genes. IBC approval is sufficient for such a reduction except for any lowering of containment under Section III–A–3–b to levels below P1+HV1, or reduction of containment levels by more than one step, which also requires prior NIH approval. (See Section IV–E–1–b–3–(e).)

III–B. *Experiments with Prokaryotic Host-Vectors Other Than E. coli K–12*

III–B–1. *HV1 and HV2 Systems.* Certain certified HV1 and HV2 host-vector systems appear in Appendix D. The containment levels for these systems are given in the subsections of Section III–A. Other systems in the future may be certified as HV1 and HV2. At the time of certification, the classification of containment levels for experiments using them will be assigned by NIH.

III–B–2. *Return of DNA Segments to Prokaryotic Non-HV1 Host of Origin.* Certain experiments involving those prokaryotes that echange genetic information with *E. coli* by known physiological processes will be exempt from these Guidelines if they appear on the "list of exchangers" set forth in Appendix A (see Section I–E–4). For a prokaryote which can exchange genetic information(*35*) with *E. coli* under laboratory conditions but which is not on the list (Host A), the following type of experiment may be carried out under P1 conditions without Host A having been approved as an HV1 host: DNA from Host A may be inserted into a vector and propagated in *E. coli* K–12 under P1 conditions. Subsequently, this recombinant DNA may be returned to Host A by mobilization, transformation, or transduction and may then be propagated in Host A in any desired vector under P1 conditions.

For a prokaryote which does not exchange genetic information with *E. coli* (Host B), the following type of experiment may be carried out without Host B having been approved as an HV1 host: DNA from Host B may be inserted into a vector and propagated in *E. coli* K–12 under P1 conditions. Subsequently, this recombinant DNA may be returned to Host B and progagated in Host B under P1 conditions.(*43*)

III–B–3. *Non-HV1 Systems.* Containment levels for other classes of experiments involving non-HV1 systems may be approved by the Director, NIH. (See Sections IV–E–1–b–(1)–(b), IV–E–1–b–(2)–(c), and IV–E–1–b–(3)–(b).)

In those cases where genetic exchange has not been demonstrated between two bacterial species A and B, neither of which is known to be pathogenic for man, animals, or plants, recombinant DNA experiments involving only A and B can be conducted under P3 containment.(*2A*) Lower levels of physical containment may be assigned by NIH for specific donor-recipient combinations (See Section IV–E–1–b–2–(f)).

III–C. *Experiments with Eukaryotic Host-Vectors.*

III–C–1. *Vertebrate Host-Vector System. (44)* The subsections of Sections III–C–1–a, –b, –c and –d involve the use of specific viral vectors, namely polyoma, SV40, human adenoviruese 2 and 5, and mouse adenovirus strain FL, respectively. The subsections of Section III–C–1–e involve the use of all viral vectors including the specific viral vectors considered in the subsections of Sections III–C–1–a, –b, –c and –d, as well as any other viral vector. When the reader finds that the containment level given for specific experiment in a subsection of Section III–C–1–e is different from the containment level given in a subsection of Section III–C–1–a, –b, –c or –d, he may choose which of the two containment levels he wishes to use for the experiment.

III–C–1–a. *Polyoma Virus.*

III–C–1–a–(1). *Productive Virus-Cell Interactions.*

III–C–1–a–(1)–(a). Defective or whole polyoma virus genomes, with appropriate helper, if necessary, can be used in P2 conditions to propagate DNA sequences:

III–C–1–a–(1)–(a)–(*1*). from bacteria of Class 1 or Class 2 (*1*) or their phages or plasmids, except for those that produce potent polypeptide toxins; (*34*)

III–C–1–a–(1)–(a)–(*2*). from mice;

III–C–1–a–(1)–(a)–(*3*). from eukaryotic organisms that do not produce potent polypeptide toxins, (*34*) provided that the DNA segment is > 99% pure.

III–C–1–a–(1)–(b). Defective polyoma genomes with appropriate helper, if necessary, can be used in P2 conditions for shotgun experiments to propagate DNA sequences from eukaryotic organisms that do not produce potent polypeptide toxins.(*34*)

III–C–1–a–(1)–(C). Whole virus genomes with appropriate helper, if necessary, can be used in P3 conditions for shotgun experiments to propagate DNA sequences from eukaryotic organisms that do not produce potent polypeptide toxins.(*34*).

III–C–1–a–(1)–(d). Experiments involving the use of defective polyoma virus genomes to propagate DNA sequences from eukaryotic viruses will be evaluated by NIH on a case-by-case basis(*45*) and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–1–a–(2). *Nonproductive Virus-Cell Interactions.* Defective or whole polyoma virus genomes can be used as vectors in P2 conditions when production of viral particles cannot occur (e.g., transformation of nonpermissive cells or prppagation of an unconditionally defective recombinant genome in the absence of helper), provided the inserted DNA sequences are not derived from eukaryotic viruses. In the latter case, such experiments will be evaluated by NIH on a case-by-case basis(*45*) and will be conducted under the precribed physical and biological containment conditions (See Section IV–E–1–b–(3)–(c).)

III–C–1–b. *Simian Virus 40.*

III–C–1–b–(1). *Productive Virus-Cell Interactions.*

III–C–1–b–(1)–(a). SV40 DNA, rendered unconditionally defective by a deletion in an essential gene, with appropriate helper, can be used in P2 conditions to propagate DNA sequences from:

III–C–1–b–(1)–(a)–(*1*). bacteria of Class 1 or Class 2.(*1*) or their phages or plasmids, except for those that produce potent polypeptide toxins;(*34*)

III–C–1–b–(1)–(a)–(*2*). unifected African green monkey kidney cell cultures.

III–C–1–b–(1)–(b). SV40 DNA, rendered unconditionally defective by a deletion in an essential gene with an appropriate helper, can be used in P3 conditions to propagate DNA sequences from eukaryotic organisms that do not produce potent polypeptide toxins(*34*) (Shotgun experiments or purified DNA).

III–C–1–b–(1)–(c). Experiments involving the use of defective SV40 genomes to progagate DNA sequences from eukaryotic viruses will be evaluated by NIH on a case-by-case basis(*45*) and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–1–b–(2). *Nonproductive Virus-Cell Interactions.* Defective or whole SV40 genomes can be used as vectors in P2 conditions when production of viral particles cannot occur (e.g., transformation of nonpermissive cells or propagation of an unconditionally defective recombinant genome in the absence of helper), provided the inserted DNS sequences are not derived from eukaryotic viruses. In the latter case, such experiments will be evaluated by NIH on a case-by-case basis(*45*) and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–1–c. *Human Adenoviruses 2 and 5.*

III–C–1–c–(1). *Productive Virus-Cell Interactions.*

III–C–1–c–(1)–(a). Human adenoviruses 2 and 5, rendered unconditionally defective by deletion of at least two essential genes, with appropriate helper, can be used in P3 conditions to propagate DNA sequences from:

III–C–1–c–(1)–(a)–(*1*). Bacteria of Class 1 or Class 2 (*1*) or their phages or plasmids except for those that produce potent ploypeptide toxins; (*34*).

III–C–1–c–(1)–(a)–(2). Eukaryotic organisms that do not produce potent polypeptide toxins (*34*) (shotgun experiments or purified DNA).

III–C–1–c–(1)–(b). Experiments involving the use of unconditionally defective human adenovirus 2 and 5 genomes to propagate DNA sequences from eukaryotic viruses will be evaluated by NIH on a case-by-case basis (*45*) and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–1–c–(2). *Nonproductive Virus-Cell Interactions.* Defective or whole human adenovirus 2 and 5 genomes can be used as vectors in P2 conditions when production of viral particles cannot occur (e.g., transformation of nonpermissive cells or propagation of an unconditionally defective recombinant genome in the absence of helper), provided the inserted DNA sequences are not derived from eukaryotic viruses. In the latter case, such experiments will be evaluated by NIH on a case-by-case basis (*45*) and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–1–d. *Murine Adenovirus Strain FL.*

III–C–1–d–(1). *Productive Virus-Cell Interactions.*

III–C–1–d–(1)–(a). Unconditionally defective murine adenovirus strain FL genomes, with appropriate helper, can be used in P2 conditions to propagate DNA sequences from:

III–C–1–d–(1)–(a)–(*1*). Bacteria of Class 1 or Class 2 (*1*) or their phages or plasmids except for those that produce potent polypeptide toxins; (*34*).

III–C–1–d–(1)–(a)–(2). Eukaryotic organisms that do not produce potent polypeptide toxins (*34*) (shotgun experiments or purified DNA).

III–C–1–d–(1)–(b). Experiments involving the use of whole murine adenovirus strain FL genomes to propagate DNA sequences from prokaryotic or eukaryotic organisms will be evaluated by NIH on a case-by-case basis (*45*) and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–1–d–(1)–(c). Experiments involving the use of unconditionally defective murine adenovirus strain FL genomes to propagate DNA sequences from eukaryotic viruses will be evaluated by NIH on a case-by-case basis (*45*) and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–1–d–(2). *Nonproductive Virus-Cell Interactions.* Defective or whole murine adenovirus strain FL genomes can be used as vectors in P2 conditions when production of viral particles cannot occur (e.g., transformation of nonpermissive cells or propagation of an unconditionally defective recombinant genome in the absence of helper), provided the inserted DNA sequences are not derived from eukaryotic viruses. In the latter case, such experiments will be evaluated by NIH on a case-by-case basis (*45*) and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–1–e. All Viral Vectors.

III–C–1–e–(1). Other experiments involving eukaryotic virus vectors can be done as follows:

III–C–1–e–(1)–(a). Recombinant DNA molecules containing no more that two-thirds of the genome of any eukaryotic virus [all viruses from a single Family (*36*) being considered identical (*50*)] may be propagated and maintained in cells in tissue culture using P1 containment. For such experiments, it must be shown that the cells lack helper virus for the specific Families of defective viruses being used. The DNA may contain fragments of the genomes of viruses from more than one Family but each fragment must be less than two-thirds of a genome.

III–C–1–e–(1)–(b). Recombinants with less than two-thirds of the genome of any eukaryotic virus may be rescued with a helper virus using P2 containment if wild type strains of the virus are CDC Class 1 or 2 agents, or using P3 containment if wild type strains of the virus are CDC Class 3 agents *(1).*

III–C–1–e–(2). Experiments involving the use of other whole or defective virus genomes to propagate DNA sequences from prokaryotic or eukaryotic organisms (and viruses), or as vectors to transform nonpermissive cells, will be evaluated by NIH on a case-by-case basis *(45)* and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

NIH will also review on a case-by-case basis *(45)* all experiments involving the use of virus vectors in animals and will prescribe the physical and biological containment conditions appropriate for such studies. (See Section IV–E–1–b–(3)–(c).)

III–C–1–f. *Nonviral Vectors.* Organelle, plasmid, and chromosomal DNAs may be used as vectors. DNA recombinants formed between such vectors and host DNA, when propagated only in that hose (or a closely related strain of the same species), are exempt from these Guidelines (see Section I–E). DNA recombinants formed between such vectors and nonviral DNA from cells other than the host species require only P1 physical containment for cells in culture since vertebrate cells in tissue culture inherently exhibit a very high level of containment. Recombinants involving viral DNA or experiments which require the use of the whole animals will be evaluated by NIH on a case-by-case basis. *(45)*

III–C–2. *Invertebrate Host-Vector Systems.*

III–C–2–a. *Insect Viral Vectors.* As soon as information becomes available on the host range restrictions and on the infectivity, persistence, and integration of the viral DNA in vertebrate and invertebrate cells, experiments involving the use of insect viruses to propagate DNA sequences will be evaluated by NIH on a case-by-case basis *(45)* and will be conducted under the recommended physical containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–2–b. *Nonviral Vectors.* Organelle, plasmid, and chromosomal DNAs may be used as vectors. DNA recombinants formed between such vectors and host DNA, when propagated only in that host (or a closely related strain of the same species), are exempt from these Guidelines (See Section I–E). DNA recombinants formed between such vectors and DNA from cells other than the host species require P1 physical containment for invertebrate cells in culture since invertebrate cells in culture inherently exhibit a very high level of containment. Experiments which require the use of whole animals will be evaluated by NIH on a case-by-case basis. *(45)*

III–C–3. *Plant Viral Host-Vector Systems. (48)* The DNA plant viruses which could currently serve as vectors for cloning genes in plants and plant cell protoplasts are Cauliflower Mosiac Virus (CaMV) and its close relatives *(2A)* which have relaxed circular double-stranded DNA genomes with a molecular weight of 4.5×10^6, and Bean Golden Mosaic Virus (BGMV) and related viruses with small ($<10^6$ daltons) single-stranded DNA genomes. CaMV is spread in nature by aphids, in which it survives for a few hours. Spontaneous mutants of CaMV which lack a factor essential for aphid transmission arise frequently. BGMV is spread in nature by whiteflies, and certain other single-stranded DNA plant viruses are transmitted by leafhoppers.

The DNA plant viruses have narrow host ranges and are relatively difficult to transmit mechanically to plants. For this reason, they are most unlikely to be accidentally transmitted from spillage of purified virus preparations.

When these viruses are used as vectors in intact plants, or propagative plant parts, the plants shall be grown under P1 conditions—that is, in either a limited access greenhouse or plant growth cabinet which is insect-restrictive, preferably with positive air pressure. *(2A)* and in which an insect fumigation regime is maintained. Soil, plant pots, and unwanted infected materials shall be removed from the greenhouse or cabinet in sealed insect-proof containers and sterilized. It is not necessary to sterilize run-off water from the infected plants, as this is not a plausible route for secondary infection. When the viruses are used as vectors in tissue cultures or in small plants in axenic cultures, no special containment is necessary.

Infected plant materials which have to be removed from the greenhouse or cabinet for further research shall be maintained under insect-restrictive conditions. These measures provide an entirely adequate degree of containment. They are similar to those required in many countries for licensed handling of "exotic" plant viruses.

The viruses or their DNA may also be useful as vectors to introduce genes into plant protoplasts. The fragility of plant protoplasts combined with the properties of the viruses provides adequate safety. Since no risk to the environment from the use of the DNA plant virus/protoplast system is envisaged, no special containment is necessary, except as described in the following paragraph.

Experiments involving the use of plant genomes to propagate DNA sequences from eukaryotic viruses will be evaluated by NIH on a case-by-case basis *(45)* and will be conducted under the prescribed physical and biological containment conditions. (See Section IV–E–1–b–(3)–(c).)

III–C–4. *Plant Host-Vector Systems Other than Viruses. (48)* Organelle, plasmid, and chromosomal DNAs may be used as vectors. DNA recombinants formed between such vectors and host DNA, when propagated only in that host (or a closely related strain of the same species), are exempt from these guidelines (see Section I–E). DNA recombinants formed between such vectors and DNA from cells other than the host species require P2 physical containment. The development of host-vector systems that exhibit a high level of biological containment, such as those using protoplasts or undifferentiated cells in culture, permit *(2A)* a decrease in the physical containment to P1.

Intact plants or propagative plant parts which cannot be grown in a standard P2 laboratory because of their large size may be grown under the P1 conditions described above in Section III–C–3, except that (i) sterilization of run-off water is required where this is a plausible route for secondary infection and (ii) the standard P2 practices are adopted for microbiological work, and (iii) negative air pressure should be employed in the greenhouse or growth chamber when infectious agents are used which generate airborne propagules.

III–C–5. *Fungal or Similar Lower Eukaryotic Host-Vector Systems.*

Certain certified HV1 and HV2 host-vector system appear in Appendix D. The containment levels for these systems are given in the subsections of Section III–A. Other systems in the future may be certified as HV1 and HV2. At the time of certification, they may be added to Appendix D (and thus the containment levels for their use will be those of the subsections of Section III–A). Alternatively, at the time of their certification, another classification of containment levels for experiments using them may be assigned by NIH.

In addition to the experiments described above, the following experiments may be carried out without the eukaryotic host (Host C) having been approved as an HV1 host: DNA from Host C may be inserted into a vector and propagated in *E. coli* K–12 under P1 conditions. Subsequently, this recombinant DNA may be returned to Host C and propagated there under P1 conditions. *(43)*

Containment levels for other classes of experiments involving non-HV1 systems may be expressly approved by the Director, NIH. (See Sections IV–E–1–b–(1)–(b), IV–E–1–b–(2)–(c), and IV–E–1–b–(3)–(b).)

III–C–6. *Return of DNA Segments to a Higher Eukaryotic Host of Origin.* DNA from a higher eukaryote (Host D) may be inserted into a vector and propagated in *E. coli* K–12 under P1 containment conditions. Subsequently, this recombinant DNA may be returned to Host D and propagated under conditions of physical containment comparable to P1 and appropriate to the organism under study. *(2A)*

III–C–7. *Transfer of cloned DNA Segments to Eukaryotic Organisms.*

III–C–7–a. *Transfer to Non-human Vertebrates.* DNA from any nonprohibited source [Section I–D], except for greater than one quarter of a eukaryotic viral genome, which has been cloned and propagated in *E. coli* under P1 conditions, may be transferred with the *E. coli* vector used for cloning to any eukaryotic cells in culture or to any non-human vertebrate organism and propagated under conditions of physical containment comparable to P1 and appropriate to the organism under study *(2A)*. Transfers to any other host will be considered by the RAC on a case-by-case basis *(45)*.

III–C–7–b. *Transfer to Higher Plants.* DNA from any nonprohibited source [Section I–D] which has been cloned and propagated in *E. coli* or *S. cerevisiae* under P1 conditions, may be transferred with the *E. coli* or *S. cerevisiae* vector used for cloning to any higher plant organisms (Angiosperms and Gymnosperms) and progagated under conditions of physical containment comparable to P1 and appropriate to the organism under study (2A). Intact plants or propagative plant parts may be grown undr P1 conditions described undr Section III–C–3. Containment must be modified to ensure that the spread of pollen, seed or other propagules is prevented. This can be accomplished by conversion to negative pressure in the growth cabinet or greenhouse or by physical entrapment by "bagging" of reproductive structures. Transfers to any other plant organisms will be considered on a case-by-case basis (45).

III–D. *Complementary DNAs.* Specific containment levels are given in Section III–A–2–a (see also last column of Table III) for complementary DNA (cDNA) of viral mRNA. For the other Sections of the Guidelines, where applicable, cDNAs synthesized *in vitro* are included within each of the above classifications. For example: cDNAs formed from cellular RNAs that are not purified and characterized are included under III–A–1, shotgun experiments; cDN's formed from purified and characterized RNAs are included under III–A–3; etc.

Due to the possibility of nucleic acid contamination of enzyme preparations used in the preparation of cDNAs, the investigator must employ purified enzyme preparations that are free of viral nucleic acid.

III–E. *Synthetic DNAs.* If the synthetic DNA segment is likely to (2A) yield a potentially harmful polynucleotide or polypeptide (e.g., a toxin or a pharmacologically active agent), the containment conditions must be as stringent as would be used for propagating the natural DNA counterpart.

If the synthetic DNA sequence codes for a harmless product,(2A) it may be propagated at the same containment level as its purified natural DNA counterpart. For example, a synthetic DNA segment which corresponds to a nonharmful gene of birds, to be propagated in *Saccharomyces cerevisiae*, would require P2 physical containment plus an HV1 host-vector, or P1 + HV2.

If the synthetic DNA segment is not expressed *in vivo* as a polynucleotide or polypeptide product, the organisms containing the recombinant DNA molecule are exempt (4) from the Guidelines.

IV. Roles and Responsibilities

IV–A. *Policy.* Safety in activities involving recombinant DNA depends on the individual conducting them. The Guidelines cannot anticipate every possible situation. Motivation and good judgement are the key essentials to protection of health and the environment.

The Guidelines are intended to help the Institution, the Institutional Biosafety Committee (IBC), the Biological Safety Officer, and the Principal Investigator determine the safeguards that should be implemented. These Guidelines will never be complete or final, since all conceivable experiments involving recombinant DNA cannot be foreseen. Therefore, it is the responsibility of the Institution and those associated with it to adhere to the *purpose* of the Guidelines as well as to their speifics.

Each Institution (and the IBC acting on its behalf) is responsible for ensuring that recombinant DNA activities comply with the Guidelines. General recognition of institutional authority and responsibility properly establishes accountability for safe conduct of the research at the local level.

The following roles and responsibilities constitute an administrative framework in which safety is an essential and integral part of research involving recombinant DNA molecules. Further clarifications and interpretations of roles and responsibilities will be issued by NIH as necessary.

IV-B. *General Applicability.* The Guidelines are applicable to all recombinant DNA research within the United States or its territories which is conducted at or sponsored by an Institution that receives any support for recombinant DNA research from NIH. This includes research performed by NIH directly.

An individual receiving support for research involving recombinant DNA must be associated with or sponsored by an Institution that can and does assume the responsibilities assigned in these Guidelines.

The Guidelines are also applicable to projects done abroad if they are supported by NIH funds. If the host country, however, has established rules for the conduct of recombinant DNA projects, then a certificate of compliance with those rules may be submitted to NIH in lieu of compliance with the NIH Guidelines. NIH reserves the right to withhold funding if the safety practices to be employed abroad are not reasonably consistent with the NIH Guidelines.

IV-C. *General Definitions.* The following terms, which are used throughout the Guidelines, are defined as follows:

IV-C-1. "DNA" means deoxyribonucleic acid.

IV-C-2. "Recombinant DNA" or "recombinant DNA molecules" means either (i) molecules which are constructed outside living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell, or (ii) DNA molecules which result from the replication of a molecule described in (i) above.

IV-C-3. (Deleted)

IV-C-4. "Institution" means any public or private entity (including Federal, State, and local government agencies).

IV-C-5. "Institutional Biosafety Committee" or "IBC" means a committee that (i) meets the requirements for membership specified in Section IV-D-2, and (ii) reviews, approves, and oversees projects in accordance with the responsibilities defined in Sections IV-D-2 and -3.

IV-C-6. "NIH Office of Recombinant DNA Activities" or "ORDA" means the office within NIH with responsibility for (i) reviewing and coordinating all activities of NIH related to the Guidelines, and (ii) performing other duties as defined in Section IV-E-3.

IV-C-7. "Recombinant DNA Advisory Committee" or "RAC" means the public advisory committee that advises the Secretary, the Assistant Secretary for Health, and the Director of the National Institutes of Health concerning recombinant DNA research. The RAC shall be constituted as specific in Section IV-E-2.

IV-C-8. "Director, NIH" or "Director" means the Director of the National Institutes of Health and any other officer or employee of NIH to whom authority has been delegated.

IV-C-9. "Federal Interagency Advisory Committee on Recombinant DNA Research" means the committee established in October 1976 to advise the Secretary, HEW, the Assistant Secretary for Health, and the Director, NIH, on the coordination of those aspects of all Federal programs and activities which relate to recombinant DNA research.

IV-C-10. "Administrative Practices Supplement" or "APS" means a publication to accompany the NIH Guidelines specifying administrative procedures for use at NIH and at Institutions.

IV-C-11. "Laboratory Safety Monograph" or "LSM" means a publication to accompany the NIH Guidelines describing practices, equipment, and facilities in detail.

IV-D. *Responsibilities of the Institution.*

IV-D-1. Each Institution conducting or sponsoring recombinant DNA research covered by these Guidelines is responsible for ensuring that the research is carried out in full conformity with the provisions of the Guidelines. In order to fulfill this responsibility, the Institution shall:

IV-D-1-a. Establish and implement policies that provide for the safe conduct of recombinant DNA research and that ensure compliance with the Guidelines. The Institution, as part of its general responsibilities for implementing the Guidelines, may establish additional procedures, as deemed necessary, to govern the Institution and its components in the discharge of its responsibilities under the Guidelines. This may include (i) statements formulated by the Institution for general implementation of the Guidelines and (ii) whatever additional precautionary steps the Institution may deem appropriate.

IV-D-1-b. Establish an Institutional Biosafety Committee (IBC) that meets the requirements set forth in Section IV-D-2 and carries out the functions detailed in Section IV-D-3.

IV-D-1-c. (Deleted)

IV-D-1-d. (Deleted)

IV-D-1-e. If the Institution is engaged in recombinant DNA research at the P3 or P4 containment level, appoint a Biological Safety Officer (BSO), who shall be a member of the IBC and carry out the duties specified in Section> IV-D-4.

IV-D-1-f. Require that investigators responsible for research covered by these Guidelines comply with the provisions of Section IV-D-5, and assist investigators to do so.

IV-D-1-g. Ensure appropriate training for the IBC chairperson and members, the BSO, Principal Investigators (PIs), and laboratory staff regarding the Guidelines, their implementation, and laboratory safety. Responsibility for training IBC members may be carried out through the IBC chairperson. Responsibility for training laboratory staff may be carried out through the PI. The Institution is responsible for seeing that the PI has sufficient training, but may delegate this responsibility to the IBC.

IV-D-1-h. Determine the necessity, in connection with each project, for health surveillance of recombinant DNA research personnel, and conduct, if found appropriate, a health surveillance program for the project. [The Laboratory Safety Monograph (LSM) discusses various possible components of such a program—for example, records of agents handled, active investigation of relevant illnesses, and the maintenance of serial serum samples for monitoring serologic changes that may result from the employees' work experience. Certain medical conditions may place a laboratory worker at increased risk in any endeavor where infectious agents are handled. Examples given in the LSM include gastrointestinal disorders and treatment with steroids, immunosuppressive drugs, or antibiotics. Workers with such disorders or treatment should be evaluated to determine whether they should be engaged in research with potentially hazardous organisms during their treatment or illness.]

IV-D-1-i. Report within 30days to ORDA any significant problems with and violations of the Guidelines and significant research-related accidents and illnesses, unless the institution determines that the PI or IBC has done so.

IV-D-2. *Membership and Procedures of the IBC.* The Institution shall establish an Institutional Biosafety Committee (IBC) meeting the following requirements:

IV–D–2–a. The IBC shall comprise no fewer than five members so selected that they collectively have experience and expertise in recombinant DNA technology and the capability to assess the safety of recombinant DNA research experiments and any poitential risk to public health or the environment. At least two members (but not less than 20 percent of the membership of the committee) shall not be affiliated with the Institution (apart from their membership on the IBC) and shall represent the interest of the surrounding community with respect to health and protection of the environment. Members meet this requirement if, for example, they are officials of State or local public health or environmental protection agencies, members of other local governmental bodies, or persons active in medical, occupational health, or environmental concerns in the community The Biological Safety Officer (BSO), mandatory when research is being conducted at the P3 and P4 levels, shall be a member (see Section IV–D–4).

IV–D–2–b. In order to ensure the professional competence necessary to review recombinant DNA activities, it is recommended that (i) the IBC include persons from disciplines relevant to recombinant DNA technology, biological safety, and engineering; (ii) the IBC include, or have available as consultants, persons knowledgeable in institution commitments and policies, applicable law, standards of professional conduct and practice, community attitudes, and the environment; and (iii) at least one member be a nondoctoral person from a laboratory technical staff.

IV–D–2–c. The Institution shall identify the committee members by name in a report to the NIH Office of Recombinant DNA Activities (ORDA) and shall include relevant background information on each member in such form and at such times as ORDA may require. (See the Administrative Practice Supplement for further guidance.)

IV–D–2–d. No member of an IBC may be involved (except to provide information requested by the IBC) in the review or approval of a project in which he or she has been, or expects to be, engaged or has a direct financial interest.

IV–D–2–e. The Institution may establish procedures that the IBC will follow in its initial and continuing review of applications, proposals, and activities. (IBC review procedures are specified in Section IV–D–3–a.)

IV–D–2–f. Central to implementation of the Guidelines is the review of experiments by the IBC. In carrying out this responsibility, the Institution shall comply with instructions and procedures specified in the Administrative Practices Supplement.

IV–D–2–g. Institutions are encouraged to open IBC meetings to the public whenever possible, consistent with protection of privacy and proprietary interests.

IV–D–2–h. Upon request, the Institution shall make available to the public all minutes of IBC meetings and any documents submitted to or received from funding agencies which the latter are required to make available to the public (e.g., reports of Guideline violations and significant research-related accidents, and agency directives to modify projects). If comments are made by members of the public on IBC actions, the Institution shall forward to NIH both the comments and the IBC's response.

IV–D–3. *Functions of the IBC.* On behalf of the Institution, the IBC is responsible for:

IV–D–3–a. Reviewing for compliance with the NIH Guidelines all recombinant DNA research conducted at or sponsored by the Institution, and approving those research projects that it finds are in conformity with the Guidelines. This review shall include:

IV–D–3–a–(1). An independent assessment of the containment levels required by these Guidelines for the proposed research, and

IV–D–3–a–(2). An assessment of the facilities, procedures, and practices, and of the training and expertise of recombinant DNA personnel.

Note.—See Laboratory Safety Monograph (pages 187–190) for suggested guidance in conducting this review.

IV–D–3–b. Notifying the Principal Investigator (PI) of the results of their review.

IV–D–3–c. Reviewing periodically recombinant DNA research being conducted at the Institution, to ensure that the requirements of the Guidelines are being fulfilled.

IV–D–3–d. Adopting emergency plans covering accidental spills and personnel contamination resulting from such research.

Note.—Basic elements in developing specific procedures for dealing with major spills of potentially hazardous materials in the laboratory are detailed in the Laboratory Safety Monograph. Included are information and references on decontamination and emergency plans. NIH and the Centers for Disease Control are available to provide consultation, and direct assistance if necessary, as posted in the LSM. The Institution shall cooperate with the State and local public health departments, reporting any significant reseach-related illness or accident that appears to be a hazard to the public health.

IV–D–3–e. Reporting within 30 days to the appropriate institutional official and to the NIH Office of Recombinant DNA Activities (ORDA) any significant problems with or violations of the Gidelines, and any significant research-related accidents or illnesses, unless the IBC determines that the PI has done so.

IV–D–3–f. The IBC may not authorize initiation of experiments not explicitly covered by the Guidelines until NIH, (with the advice of the RAC when required) establishes the containment requirement.

IV–D–3–g. Performing such other functions as may be delegated to the IBC under Section IV–D–1.

IV–D–4. *Biological Safety Officer.* The Institution shall appoint a BSO if it engages in recombinant DNA research at the P3 or P4 containment level. The officer shall be a member of the Institutional Biosafety Committee (IBC), and his or her duties shall include (but need not be limited to):

IV–D–4–a. Ensuring through periodic inspections that laboratory standards are rigorously followed;

IV–D–4–b. Reporting to the IBC and the Institution all significant problems with and violations of the Guidelines and all significant research-related accidents and illnesses of which the BSO becomes aware, unless the BSO determines that the Principal Investigator (PI) has done so;

IV–D–4–c. Developing emergency plans for dealing with accidental spills and personnel contamination, and investigating recombinant DNA research laboratory accidents;

IV–D–4–d. Providing advice on laboratory security;

IV–D–4–e. Providing technical advice to the PI and the IBC on research safety procedures.

Note.—See Laboratory Safety Monograph for additional information on the duties of the BSO.

IV–D–5. *Principal Investigator.* On behalf of the Institution, the PI is responsible for complying fully with the Guidelines in conducting any recombinant DNA research.

IV–D–5–a. *PI—General.* As part of this general responsibility, the PI shall:

IV–D–5–a–(1). Initiate or modify no recombinant DNA research subject to the Guidelines until that research, or the proposed modification thereof, has been approved by the Institutional Biosafety Committee (IBC) and has met all other requirements of the Guidelines and the Administrative Practices Supplement (APS).

(Note.—No prior approval by the IBC is required for most experiments described in Section III–O. Modify containment and experimental protocol according to recommendations of the IBC.)

IV–D–5–a–(2). Report within 30 days to the IBC and NIH (ORDA) all significant problems with and violations of the Guidelines and all significant research-related accidents and illnesses;

IV–D–5–a–(3). Report to the IBC and to NIH (ORDA) new information bearing on the Guidelines;

IV–D–5–a–(4). Be adequately trained in good microbiological techniques;

IV–D–5–a–(5). Adhere to IBC-approved emergency plans for dealing with accidental spills and personnel contamination; and

IV–D–5–a–(6). Comply with shipping requirements for recombinant DNA molecules. (See Section II–C for shipping requirements, Laboratory Safety Monograph for technical recommendations, and the APS for administrative instructions and procedures. The requesting laboratory must be in compliance with the NIH Guidelines and under appropriate review by its IBC, and the sending investigator must maintain a record of all shipments of recombinant DNA materials.)

IV–D–5–b. *Submissions by the PI to NIH.* The PI shall:

IV–D–5–b–(1). Submit information to NIH (ORDA) in order to have new host-vector systems certified;

IV–D–5–b–(2). Petition NIH, with notice to the IBC, for exemptions to these Guidelines (see Sections I–E–4 and I–E–5 and, for additional information on procedures, the APS); and

IV–D–5–b–(3). Petition NIH, with concurrence of the IBC, for exceptions to the prohibitions under these Guidelines (see Section I–D and, for additional information on procedures, the APS).

IV–D–5–b–(4). Petition NIH for determination of containment for experiments requiring case-by-case review.

IV–D–5–b–(5). Petition NIH for determination of containment for experiments not covered by the Guidelines.

IV–D–5–c. *Submissions by the PI to the IBC.* The PI shall:

IV–D–5–c–(1). Make the initial determination of the required levels of physical and biological containment in accordance with the Guidelines;

IV–D–5–c–(2). Select appropriate microbiological practices and laboratory techniques to be used in the research;

IV–D–5–c–(3). Submit the initial research protocol (and also subsequent changes—e.g., changes in the source of DNA or host-vector system) to the IBC for review and approval or disapproval, and

IV–D–5–c–(4). Remain in communication with the IBC throughout the conduct of the project.

IV–D–5–d. *PI Responsibilities After Approval but Prior to Initiating the Research.* The PI is responsible for:

IV–D–5–d–(1). Making available to the laboratory staff copies of the approved protocols that describe the potential biohazards and the precautions to be taken;

IV–D–5–d–(2). Instructing and training staff in the practices and techniques required to ensure safety and in the procedures for dealing with accidents; and

IV–D–5–d–(3). Informing the staff of the reasons and provisions for any precautionary medical practices advised or requested, such as vaccinations or serum collection.

IV–D–5–e. *PI Responsibilities During the Conduct of the Approved Research.* The PI is responsible for:

IV–D–5–e–(1). Supervising the safety performance of the staff to ensure that the required safety practices and techniques are employed;

IV–D–5–e–(2). Investigating and reporting in writing to ORDA, the Biological Safety Officer (where applicable), and the IBC any significant problems pertaining to the operation and implementation of containment practices and procedures;

IV–D–5–e–(3). Correcting work errors and conditions that may result in the release of recombinant DNA materials;

IV–D–5–e–(4). Ensuring the integrity of the physical containment (e.g., biological safety cabinets) and the biological containment (e.g., purity, and genotypic and phenotypic characteristics); and

IV–D–5–e–(5). *Publications.* PIs are urged to include, in all publications reporting on recombinant DNA research, a description of the physical and biological containment procedures employed.

IV–E. *Responsibilities of NIH.*

IV–E–1. *Director.* The Director, NIH, is responsible for (i) establishing the NIH Guidelines on recombinant DNA research, (ii) overseeing their implementation, and (iii) their final interpretation.

The Director has a number of responsibilities under the Guidelines that involve the NIH Office of Recombinant DNA Activities (ORDA) and the Recombinant DNA Advisory Committee (RAC). ORDA's responsibilities under the Guidelines are administrative. Advice from the RAC is primarily scientific and technical. In certain circumstances, there is specific opportunity for public comment, with published response, before final action.

IV–E–1–a. *General Responsibilities of the Director, NIH.* The responsibilities of the Director shall include the following:

IV–E–1–a–(1). Promulgating requirements as necessary to implement the Guidelines;

IV–E–1–a–(2). Establishing and maintaining the RAC to carry out the responsibilities set forth in Section IV–E–2. The RAC's membership is specified in its charter and in Section IV–E–2;

IV–E–1–a–(3). Establishing and maintaining ORDA to carry out the responsibilities defined in Section IV–E–3; and

IV–E–1–a–(4). Maintaining the Federal Interagency Advisory Committee on Recombinant DNA Research established by the Secretary, HEW, for advice on the coordination of all Federal programs and activities relating to recombinant DNA, including activities of the RAC.

IV–E–1–b. *Specific Responsibilities of the Director, NIH.* In carrying out the responsibilities set forth in this Section, the Director shall weigh each proposed action, through appropriate analysis and consultation, to determine that it complies with the Guidelines and presents no significant risk to health or the environment.

IV–E–1–b–(1). *The Director is responsible for the following major actions* (For these, the Director must seek the advice of the RAC and provide an opportunity for public and Federal agency comment. Specifically, the agenda of the RAC meeting citing the major actions will be published in the **Federal Register** at least 30 days before the meeting, and the Director will also publish the proposed actions in the **Federal Register** for comment at least 30 days before the meeting. In addition, the Director's proposed decision, at his discretion, may be published in the **Federal Register** for 30 days of comment before final action is taken. The Director's final decision, along with response to the comments, will be published in the **Federal Register** and the *Recombinant DNA Technical Bulletin.* The RAC and IBC chairpersons will be notified of this decision):

IV–E–1–b–(1)–(a). Changing containment levels for types of experiments that are specified in the Guidelines when a major action is involved;

IV–E–1–b–(1)–(b). Assigning containment levels for types of experiments that are not explicitly considered in the Guidelines when a major action is involved;

IV–E–1–b–(1)–(c). Certifying new host-vector systems, with the exception of

minor modifications of already certified systems. [The standards and procedures for certification are described in Section II–D–2–a. Minor modifications constitute, for example, those of minimal or no consequence to the properties relevant to containment. See the Administrative Practices Supplement (APS) for further information];

IV–E–1–b–(1)–(d). Promulgating and amending a list of classes of recombinant DNA molecules to be exempt from these because they consist entirely of DNA segments from species that exchange DNA by known physiological processes, or otherwise do not present a significant risk to health or the environment (see Sections I–E–4 and –5 and the APS for further information);

IV–E–1–b–(1)–(e). Permitting exceptions to the prohibited experiments in the Guidelines, in order, for example, to allow risk-assessment studies; and

IV–E–1–b–(1)–(f). Adopting other changes in the Guidelines.

IV–E–1–b–(2). *The Director is also responsible for the following lesser* actions (For these, the Director must seek the advice of the RAC. The Director's decision will be transmitted to the RAC and IBC chairpersons and published in the Recombinant DNA Technical Bulletin):

IV–E–1–b–(2)–(a). Interpreting and determining containment levels, upon request by ORDA;

IV–E–1–b–(2)–(b). Changing containment levels for experiments that are specified in the Guidelines (see Section III);

IV–E–1–b–(2)–(c). Assigning containment levels for experiments not explicitly considered in the Guidelines (see Section III);

IV–E–1–b–(2)–(d). Designating certain class 2 agents as class 1 for the purpose of these Guidelines (see Footnote 1 and Appendix B);

IV–E–1–b–(2)–(e). Assigning containment levels for experiments with recombinant DNA from Class 3 organisms(*1*) and assigning containment levels for experiments which increase the host-range and virulence of plant pathogens beyond that which occurs by natural genetic exchange; and

IV–E–1–b–(2)–(f). Assigning containment levels for experiments in which both donor and recipient are non-pathogenic prokaryotes (see Section III–B–3).

IV–E–1–b–(3). *The Director is also responsible for the following actions.* (The Director's decision will be transmitted to the RAC and IBC chairpersons and published in the *Recombinant DNA Technical Bulletin*):

IV–E–1–b–(3)–(a). Interpreting the Guidelines for experiments to which the Guidelines specifically assign containment levels;

IV–E–1–b–(3)–(b). Determining appropriate containment conditions for experiments according to case precedents developed under Section IV–E–1–b–(2)–(c).

IV–E–1–b–(3)–(c). Determining appropriate containment conditions upon case-by-case analysis of experiments explicity considered in the Guidelines but for which no containment levels have been set (see Footnote 45 in Part V; Sections III–C–1–a through –e; and Sections III–C–2 and –3);

IV–E–1–b–(3)–(d). Authorizing, under procedures specified by the RAC, large-scale experiments (i.e., involving more than 10 liters of culture) for recombinat DNAs that are rigorously characterized and free of harmful sequences (see Footnote 3 and Section I–D–6);

IV–E–1–b–(3)–(e). Lowering containment levels for characterized clones or purified DNA (see Sections III–A–3–a and –b, and Footnotes 3 and 41);

IV–E–1–b–(3)–(f). Approving minor modifications of already certified host-vector systems. (The standards and procedures for such modifications are described in Section II–D–2); and

IV–E–1–b–(3)–(g). Decertifying already certified host-vector systems.

IV–E–1–b–(4). The Director shall conduct, support, and assist training programs in laboratory safety for Institutional Biosafety Committee members, Biological Safety Officers, Principal Investigators, and laboratory staff.

IV–E–1–b–(5). The Director, at the end of 36 months from the time these Guidelines are promulgated, will report on the Guidelines, their administration, and the potential risks and benefits of this research. In doing so, the Director will consult with the RAC and the Federal Interagency Committee. Public comment will be solicited on the draft report and taken into account in transmitting the final report to the Assistant Secretary for Health and the Secretary, HEW.

IV–E–2. *Recombinant Advisory Committee.* The NIH Recombinant DNA Advisory Committee (RAC) is responsible for carrying out specified functions cited below as well as others assigned under its charter or by the Secretary, HEW, the Assistant Secretary for Health, and the Director, NIH.

The members of the committee shall be chosen to provide, collectively, expertise in scientific fields relevant to recombinant DNA technology and biological safety—e.g., microbiology, molecular biology, virology, genetics, epidemiology, infectious diseases, the biology of enteric organisms, botany, plant pathology, ecology, and tissue culture. At least 20 percent of the members shall be persons knowledgeable in applicable law, standards of professional conduct and practice, public attitudes, the environment, public health, occupational health, or related fields. Representatives from Federal agencies shall serve as nonvoting members. Nominations for the RAC may be submitted to the NIH Office of Recombinant DNA Activities, Bethesda, Md. 20205.

All meetings of the RAC will be announced in the Federal Register, including tentative agenda items, 30 days in advance of the meeting, with final agendas (if modified) available at least 72 hours before the meeting. No item defined as a major action under Section IV–E–1–b–(1) may be added to an agenda after it appears in the Federal Register.

IV–E–2–a. *The RAC shall be responsible for advising the Director, NIH, on the actions listed in Section IV–E–1–b–(1)* and *–(2).*

IV–E–3. *The Office of Recombinant DNA Activities.* ORDA shall serve as a focal point for information on recombinant DNA activities and provide advice to all within and outside NIH, including Institutions, Biological Safety Committee, Principal Investigators, Federal agencies, State and local governments, and institutions in the private sector. ORDA shall carry out such other functions as may be delegated to it by the Director, NIH, including those authorities described in Section IV–E–1–b–(3). In addition, ORDA shall be responsible for the following:

IV–E–3–a. Review and approval of Institutional Biosafety Committee (IBC) membership;

IV–E–3–b through IV–E–3–c–(3). (Deleted)

IV–E–3–c–(4). Publish in the Federal Register:

IV–E–3–c–(4)–(a). Announcements of Recombinant DNA Advisory Committee (RAC) meetings and agenda 30 days in advance, with publication of the Director's proposed decision for 30 days of public and Federal agency comment followed by a published response, on any action listed in Section IV–E–1–(b)–(1); and

IV–E–3–c–(4)–(b). Announcements of RAC meetings and agendas 30 days in advance on any action listed in Section IV–E–1–b–(2).

Note.—If the agenda for an RAC meeting is modified, ORDA shall make the revised agenda available to anyone, upon request, at least 72 hours in advance of the meeting.

IV–E–3–c–(5). Publish the *Recombinant DNA Technical Bulletin;* and

IV–E–3–c–(6). Serve as executive secretary to the RAC.

IV–E–4. *Other NIH Components.* Other NIH components shall be responsible for:

IV–E–4–a. (Deleted)

IV–E–4–b. Certifying P4 facilities, inspecting them periodicaily, and inspecting other recombinant DNA facilities as deemed necessary; and

IV–E–4–c. Announcing and distributing certified HV2 and HV3 host-vector systems (see Section II–E–3).

(See Administrative Practices Suplement for additional information on the administrative procedures of ORDA and other NIH components.)

IV–F. (Deleted)

IV–G. *Compliance.* As a condition for NIH funding of recombinant DNA research, institutions must ensure that such research conducted at or sponsored by the Institution, irrespective of the source of funding, shall comply with these Guidelines. The policies on noncompliance are as follows:

IV–G–1. All NIH-funded projects involving recombinant DNA techniques must comply with the NIH Guidelines. Noncompliance may result in (i) suspension, limitation, or termination of financial assistance for such projects and of NIH funds for other recombinant DNA research at the Institution, or (ii) a requirement for prior NIH approval of any or all recombinant DNA projects at the Institution.

IV–G–2. All non-NIH funded projects involving recombinant DNA techniques conducted at or sponsored by an Institution that receives NIH funds for projects involving such techniques must comply with the NIH Guidelines. Noncompliance may result in (i) suspension, limitation, or termination of NIH funds for recombinant DNA research at the Institution, or (ii) a requirement for prior NIH approval of any or all recombinant DNA projects at the Institution.

IV–G–3. Information concerning noncompliance with the Guidelines may be brought foward by any person. It should be delivered to both NIH (ORDA) and the relevant Institution. The Institution, generally through the IBC, shall take appropriate action. The Institution shall forward a complete report of the incident to ORDA, recommending any further action indicated.

IV–G–4. In cases where NIH proposes to suspend, limit, or terminate financial assistance because of noncompliance with the Guidelines, applicable DHEW and Public Health Service procedures shall govern.

IV–G–5. *Voluntary Compliance.* Any individual, corporation, or institution that is not otherwise covered by the Guidelines is encouraged to conduct recombinant DNA research activities in accordance with the Guidelines, through the procedures set forth in Part VI.

V. Footnotes And References

1. The reference to organisms as Class 1, 2, 3, 4, or 5 refers to the classification in the publication *Classification of Etiologic Agents on the Basis of Hazard,* 4th Edition, July 1974; U.S. Department of Health, Education, and Welfare, Public Health Service, Centers for Disease Control, Office of Biosafety, Atlanta, Georgia 30333. The list of organisms in each class, as given in this publication, is reprinted in Appendix B to these Guidelines.

The Director, NIH, with advice of the Recombinant DNA Advisory Committee, may designate certain of the agents which are listed as Class 2 in the *Classification of Etiologic Agents on the Basis of Hazard,* 4th Edition, July 1974, as Class 1 agents for the Purposes of these Guidelines (See section IV–E–1–b–(2)–(d)). An updated list of such agents may be obtained from the Office of Recombinant DNA Activities (ORDA), National Institutes of Health, Bethesda, Maryland 20205.

The entire *Classification of Etiologic Agents on the Basis of Hazard* is in the process of revision.

For experiments using Vesicular Stomatitis virus (VSV), contact the NIH Office of Recombinant DNA Activities.

2A. In Parts I and III of the Guidelines, there are a number of places where Judgments are to be made. These include: "cells known to be infected with such agents" (Section I–D–1) "toxins potent for vertebrates" (Section I–D–2); "known to acquire it naturally" (Section I–D–5); "known to produce a potent polypeptide toxin * * * or known to carry such pathogens * * * not likely to be a product of closely linked eukaryote genes * * * shown not to contain such agents" (Section III–A–1–a–(5)–(a)); "shown to be free of disease causing microorganisms" (Section III–A–1–a–(5)–(b)); "close relatives" (Section III–C–3); and "procduce a potent polypeptide toxin" (Footnote 34).

In all these cases the principal investigator is to make the initial judgment on these matters as part of his responsibility to "make the initial determination of the required levels of physical and biological containment in accordance with the Guidelines" (Section IV–D–7–a). In all these cases, this judgment is to be reviewed and approved by the Institutional Biosafety Committee as part of its responsibility to make "an independent assessment of the containment levels required by these Guidelines for the proposed research" (Section IV–D–3–a–(1)). If the IBC wishes, any specific cases may be referred to the NIH Office of Recombinant DNA Activities as part of ORDA's functions to "provide advice to all within and outside NIH" (Section IV–E–3), and ORDA may request advice from the Recombinant DNA Advisory Committee as part of the RAC's responsibility for "interpreting and determining containment levels upon request by ORDA" (Section IV–E–1–b–(2)–(a)).

3. The following types of data should be considered in determining whether DNA recombinants are "characterize" and the absence of harmful sequences has been established: (a) the absence of potentially harmful genes (e.g., sequences contained in indigenous tumor viruses or sequences that code for toxins, invasins, virulence factors, etc., that might potentiate the pathogenicity or communicability of the vector and/or the host or be detrimental to humans, animals, or plants); (b) the type(s) of genetic information on the cloned sedment and the nature of transcriptional and translation gene products specified; (c) the relationship between the recovered and desired segment (e.g., hybridization and restriction endonuckease fragmentation analysis where applicable); (d) the genetic stabillity of the cloned fragment; and (e) any alterations in the biological properties of the vector and host.

4. In Section I–E, "exemptions" from the Guidelines are discussed. Such experiments are not covered by the Guidelines and need not be registered with NIH. In Section I–D on "prohibitions," the possibility of "exceptions" is discussed. An "exception" means that any experiment may be expressly released from a prohibition. At that time it will be assigned an appropriate level of physical and biological containment.

5. Care should be taken to inactivate recombinant DNA before disposal. Procedures for inactivating DNA can be found in the "Laboratory Safety Monograph: A Supplement to the NIH Guidelines for Recombinant DNA Research."

6. *Laboratory Safety at the Center for Disease Control* (Sept. 1974). U.S. Department of Health, Education, and Welfare Publication No. CDC 75–8118.

1. *Classification of Etiologic Agents on the Basis of Hazard.* (4th Edition, July 1974). U.S. Department of Health, Education and Welfare. Public Health Service. Centers for Disease Control, Office of Biosafety, Atlanta, Georgia 30333.

8. *National Cancer Institute Safety Standards for Research Involving Oncogenic Viruses* (Oct. 1974). U.S. Department of Health, Education and Welfare Publication No. (NIH) 75–790.

9. *National Institutes of Health Biohazards Safety Guide* (1974). U.S. Department of Health, Education, and Welfare, Public Health.

10. *Biohazards in Biological Research* (1973). A. Hellman, M. N Oxman, and R. Pollack (ed.) Cold Spring Harbor Laboratory.

11. *Handbook of Laboratory Safety* (1971). Second Edition. N. V. Steere (ed.). The Chemical Rubber Co., Cleveland.

12. Bodily, J. L. (1970). *General Administration of the Laboratory,* H. L. Bodily, E. L. Updyke, and J. O. Mason (eds.), Diagnostic Procedures for Bacterial, Mycotic and Parasitic Infections. American Public Health Association, New York, pp. 11–28.

13. Darlow, H. M. (1969). *Safety in the Microbiological Laboratory.* In J. R. Norris and D. W. Robbins (ed.), Methods in Microbiology. Academic Press, Inc. New York. pp. 169–204.

14. *The Prevention of Laboratory Acquired Infection* (1974). C. H. Collins, E. G. Hartley, and R. Pilsworth. Public Health Laboratory Service, Monograph Series No. 8.

15. Chatigny, M. A. (1961). *Protection Against Infection in the Microbiological Laboratory: Devices and Procedures.* In W. W. Umbreit (ed.). Advances in Applied Microbiology. Academic Press, New York, N.Y. 3:131–192.

16. *Design Criteria for Viral Oncology Research Facilities* (1975). U.S. Department of Health, Education and Welfare, Public Health Service, National Institutes of Health, DHEW Publication No. (NIH) 75–891.

17. Kuehne, R. W. (1973). *Biological Containment Facility for Studying Infectious Disease.* Appl. Microbiol. 26–239–243.

18. Runkle, R. S., and G. B. Phillips (1969). *Microbial Containment Control Facilities.* Van Nostrand Reinhold, New York.

19. Chatigny, M. A., and D. I. Clinger (1969). *Contamination Control in Aerobiology.* In R. L. Dimmick and A. B. Akers (eds.). An Introduction to Experimental Aerobiology. John Wiley & Sons, New York, pp. 194–263.

19A. Horsfall, F. L., Jr., and J. H. Baner (1940). *Individual Isolation of Infected Animals in a Single Room* J. Bact. *40*, 569–580.

20. Biological safety cabinets referred to in this section are classified as *Class I, Class II,* or *Class III* cabinets. A *Class I* is a ventilated cabinet for personnel protection having an inward flow of air away from the operator. The exhaust air from this cabinet is filtered through a high-efficiency particulate air (HEPA) filter. This cabinet is used in three operational modes: (1) with a full-width open front, (2) with an installed front closure panel (having four 8-inch diameter openings) without gloves, and (3) with an installed front closure panel equipped with arm-length rubber gloves. The face velocity of the inward flow of air through the full-width open front is 75 feet per minute or greater. A *Class II* cabinet is a ventilated cabinet for personnel and product protection having an open front with inward air flow for personnel protection, and HEPA filtered mass recirculated air flow for product protection. The cabinet exhaust air is filtered through a HEPA filter. The face velocity of the inward flow of air through the full-width open front is 75 feet per minute or greater. Design and performance specifications for *Class II* cabinets have been adopted by the National Sanitation Foundation, Ann Arbor, Michigan. A *Class III* cabinet is a closed-front ventilated cabinet of gas-tight construction which provides the highest level of personnel protection of all biohazard safety cabinets. The interior of the cabinet is protected from contaminants exterior to the cabinet. The cabinet is fitted with arm-length rubber gloves and is operated under a negative pressure of at least 0.5 inches water gauge. All supply air is filtered through HEPA filters. Exhaust air is filtered through two HEPA filters or one HEPA filter and incinerator before being discharged to the outside environment.

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22. Wensink, P. C., D. J. Finnegan, J. E. Donelson, and D. S. Hogness (1974). *A System for Mapping DNA Sequences in the Chromosomes of Drosophila Melanogaster.* Cell *3*, 315–335.

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26. Cohen, S. N., A. C. W. Chang, H. Boyer, and R. Helling (1973). *Construction of Biologically Functional Bacterial Plasmids in Vitro.* Proc. Natl. Acad. Sci. USA *70*, 3240–3244.

27. Bolivar, F., R. L. Rodriguez, R. J. Greene, M. C. Batlach, H. L. Reyneker, H. W. Boyer, J. H. Crosa, and S. Falkow (1977). *Construction and Characterization of New Cloning Vehicles: II. A Multi-Purpose Closing System.* Gene *2*, 95–113.

28. Thomas, M., J. R. Cameron, and R. W. Davis (1974). *Viable Molecular Hybrids of Bacteriophage Lambda and Eukaryotic DNA.* Proc. Nat. Acad. Sci. USA *71*, 4579–4583.

29. Murray, N. E., and K. Murray (1974). *Manipulation of Restriction Targets in Phage Lambda to Form Receptor Chromosomes for DNA Fragments.* Nature *251*, 476–481.

30. Rambach, A., and P. Tiollais (1974). *Bacteriophage Having EcoRI Endonucleuse Sites Only in the Non-Essential Region of the Genome.* Proc. Nat. Acad. Sci., USA *71*, 3928–3930.

31. Blattner, F. R., B. G. Williams, A. E. Bleche, K. Denniston-Thompson, H. E. Faber, L. A. Furlong, D. J. Gunwald, D. O. Kiefer, D. D. Moore, J. W. Shumm, E. L. Sheldon, and O. Smithies (1977). *Charon Phages: Safer Derivatives of Bacteriophage Lambda for DNA Cloning.* Science 196, 163–169.

32. Donoghue, D. J., and P. A. Sharp (1977). *An Improved Lambda Vector: Construction of Model Recombinants Coding for Kanamycin Resistance,* Gene *1*, 209–227.

33. Leder, P., D. Tiemeier and L. Enquist (1977). *EK2 Derivatives of Bacteriophage Lambda Useful in the Cloning of DNA from Higher Organisms: The gt WES System.* Science *196*, 175–177.

33A. Skalka, A. (1978). *Current Status of Coliphage EK2 Vectors.* Gene *3*, 29–35.

33B. Szybalski, W., A. Skalka, S. Gottesman, A. Campbell, and D. Botstein (1978). *Standardized Laboratory Tests for EK2 Certification.* Gene *3*, 36–38.

34. We are specifically concerned with the remote possibility that potent toxins could be produced by acquiring a single gene or cluster of genes. See also footnote 2A.

35. Defined as observable under optimal laboratory conditions by transformation, transduction, phage infection, and/or conjugation with transfer of phage, plasmid, and/or chromosomal genetic information. Note that this definition of exchange may be less stringent than that applied to exempt organisms under Section I–E–4.

36. As classified in the Third Report of the International Committee on Taxonomy of Viruses: Classification and Nomenclature of Viruses, R. E. F. Matthews, Ed. Intervirology 12 (129–296) 1979. (As noted in the Prohibition Section, the use of viruses classified [1] as Class 4 or 5 is prohibited.)

37. The cDNA copy of the viral mRNA must be >99% pure; otherwise as for shotgun experiments with eukaryotic cellular DNA.

37A. For the purpose of these Guidelines, viruses of the families *Papovaviridae, Adenoviridae,* and *Herpetoviridae* (36) should be considered as "transforming" viruses. While only certain of these viruses have been associated with cell transformation *in vivo* or *in vitro,* it seems prudent to consider all members to be potentially capable of transformation. In addition, those viruses of the family *Poxviridae* that produce proliferative responses—i.e., myxoma, rabbit and squirrel fibroma, and Yaba viruses-should be considered as "transforming."

38. ≥99% pure (i.e., less than 1% of the DNA consists of intact viral genomes); otherwise as for whole genomes.

39. The viruses have been classified by NCI as "moderate-risk oncogenic viruses." See "Laboratory Safety Monograph—A Supplement to the NIH Guidelines for Recombinant DNA Research" for recommendations on handling the viruses themselves.

40. (Deleted)

41. The DNA preparation is defined as "purified" if the desired DNA represents at least 99% (w/w) of the total DNA in the preparation, provided that it was verified by more than one procedure.

42. The lowering of the containment level when this degree of purification has been obtained is based on the fact that the total number of clones that must be examined to obtain the desired clone is markedly reduced. Thus, the probability of cloning a harmful gene could, for example, be reduced by more than 10^6-fold when a nonrepetitive gene from mammals was being sought. Furthermore, the level of purity specified here makes it easier to establish that the desired DNA does not contain harmful genes.

43. This is not permitted, of course, if it falls under any of the Prohibitions of Section I–D. Of particular concern here is prohibition I–D–5, i.e., "Deliberate transfer of a drug resistance trait to micro-organisms that are not known to acquire it naturally if such acquisition could compromise the use of a drug to control disease agents in human or veterinary medicine or agriculture."

44. Because this work will be done almost exclusively in tissue culture cells, which have no capacity for propagation outside the laboratory, the primary focus for containment is the vector. It should be pointed out that risk of laboratory-acquired infection as a consequence of tissue culture manipulation is very low. Given good microbiological practices, the most likely mode of escape of recombinant DNAs from a physically contained laboratory is carriage by an infected human. Thus the vector with an inserted DNA segment should have little or no ability to replicate or spread in humans.

For use as a vector in a vertebrate host cell system, an animal viral DNA molecule should display the following properties:

(i) It should not consist of the whole genome of any agent that is infectious for humans or that replicates to a significant extent in human cells in tissue culture. If the recombinant molecule is used to transform nonpermissive cells (i.e., cells which do not produce infectious virus particles), this is not a requirement.

(ii) It should be derived from a virus whose epidemiological behavior and host range are well understood.

(iii) In permissive cells, it should be defective when carrying an inserted DNA segment (i.e., propagation of the recombinant DNA as a virus must be dependent upon the presence of a complementing helper genome). In almost all cases this condition would be achieved automatically by the manipulations used to construct and propagate the recombinants. In addition, the amount of DNA encapsidated in the particles of most animal viruses is defined within fairly close limits. The insertion of sizable foreign DNA sequences, therefore, generally demands a compensatory deletion of viral sequences. It may be possible to introduce very short insertions (50–100 base pairs) without rendering the viral vector defective. In such a situation, the requirement that the viral vector be defective is not necessary, except in those cases in which the inserted DNA encodes a biologically active polypeptide.

It is desired but not required that the functional anatomy of the vector be known—that is, there should be a clear idea of the location within the molecule of:

(i) the sites at which DNA synthesis originates and terminates,

(ii) the sites that are cleaved by restriction endonucleases, and

(iii) the template regions for the major gene product.

If possible the helper virus genome should:

(i) be integrated into the genome of a stable line of host cells (a situation that would effectively limit the growth of the vector recombinant to such cell lines) or

(ii) consist of a defective genome, or an appropriate conditional lethal mutant virus, making vector and helper dependent upon each other for propagation.

However, neither of these stipulations is a requirement.

45. Review of NIH on a case-by-case basis means that NIH must review and set appropriate containment conditions before the work may be undertaken. NIH actions in such case-by-case reviews will be published in the *Recombinant DNA Technical Bulletin.*

46. Provided the inserted DNA sequences are not derived from eukaryotic viruses. In the latter case, such experiments will be evaluated on a case-by-case basis.

47. >99% pure; otherwise as for shotgun experiments.

48. A USDA permit, required for import and interstate transport of pathogens, may be obtained from the Animal and Plant Health Inspection Service, USDA, Federal Building, Hyattsville, MD 20782.

49. A subset of non-conjugative plasmid vectors are also poorly mobilizable (e.g., pBR322, pBR313). Where practical, these vectors should be employed.

50. i.e., the total of all genomes within a Family shall not exceed two-thirds of the genome.

VI. Voluntary Compliance

VI–A. *Basic Policy.* Individuals, corporations, and institutions not otherwise covered by the Guidelines are encouraged to do so by following the standards and procedures set forth in Parts I–IV of the Guidelines. In order to simplify discussion, references hereafter to "institutions" are intended to encompass corporations, and individuals who have no organizational affiliation. For purposes of complying with the Guidelines, an individual intending to carry out research involving recombinant DNA is encouraged to affiliate with an institution that has an Institutional Biosafety Committee approved under the Guidelines.

Since commercial organizations have special concerns, such as protection of proprietary data, some modifications and explanations of the procedures in Parts I–IV are provided below, in order to address these concerns.

VI–B. *IBC Approval.* The NIH Office of Recombinant DNA Activities (ORDA) will review the membership of an institution's Institutional Biosafety Committee (IBC) and, where it finds the IBC meets the requirements set forth in Section IV–D–2, will give its approval to the IBC membership.

It should be emphasized that employment of an IBC member solely for purposes of membership on the IBC does not itself make the member an institutionally affiliated member for purposes of Section IV–D–2–a.

Except for the unaffiliated members, a member of an IBC for an institution not otherwise covered by the Guidelines may participate in the review and approval of a project in which the member has a direct financial interest, so long as the member has not been and does not expect to be engaged in the project. Section IV–D–2–d is modified to that extent for purposes of these institutions.

VI–C. (Deleted)

VI–D. *Certification of Host-Vector Systems.* A host-vector system may be proposed for certification by the Director, NIH, in accordance with the procedures set forth in Section II–D–2–a.

Institutions not otherwise covered by the Guidelines will not be subject to Section II–D–3 by complying with these procedures.

In order to ensure protection for proprietary data, any public notice regarding a host-vector system which is designated by the institution as proprietary under Section VI–F–1 will be issued only after consultation with the institution as to the content of the notice.

VI–E. *Requests for Exceptions, Exemptions, Approvals.* Requests for exceptions from prohibitions, exemptions, or other approvals required by the Guidelines should be requested by following the procedures set forth in the appropriate sections in Parts I–IV of the Guidelines.

In order to ensure protection for proprietary data, any public notice regarding a request for an exception, exemption, or other approval which is designated by the institution as proprietary under Section VI–F–1 will be issued only after consultation with the institution as to the content of the notice.

VI–F. *Protection of Proprietary Data.* In general, the Freedom of Information Act requires Federal agencies to make their records available to the public upon request. However, this requirement does not apply to, among other things, "trade secrets and commercial and financial information obtained from a person and privileged or confidential." 18 U.S.C. 1905, in turn makes it a crime for an officer or employee of the United States or any Federal department or agency to publish, divulge, disclose, or make known "in any manner or to any extent not authorized by law any information coming to him in the course of his employment or official duties or by reason of any examination or investigation made by, or return, report or record made to or filed with, such department or agency or officer or employee thereof, which information concerns or relates to the trade secrets, [or processes * * * of any person, firm, partnership, corporation, or association." This provision applies to all employees of the Federal Government, including special Government employees. Members of the Recombinant DNA Advisory Committee are "special Government employees."

VI–F–1. In submitting information to NIH for purposes of complying voluntarily with the Guidelines, an institution may designate those items of information which the institution believes constitute trade secrets or privileged or confidential commercial or financial information.

VI–F–2. If NIH receives a request under the Freedom of Information Act for information so designated, NIH will promptly contact the institution to secure its views as to whether the information (or some portion) should be released.

VI–F–3. If the NIH decides to release this information (or some portion) in response to a Freedom of Information request or otherwise, the institution will

be advised; and the actual release will not be made until the expiration of 15 days after the institution is so advised, except to the extent that earlier release, in the judgement of the Director, NIH, is necessary to protect against an imminent hazard to the public or the environment.

VI–F–4. Projects should be registered in accordance with procedures specified in the *Administrative Practices Supplement*. The following information will usually be considered publicly available information, consistent with the need to protect proprietary data:

a. The names of the institution and principal investigator.

b. The location where the experiments will be performed.

c. The host-vector system.

d. The source of the DNA.

e. The level of physical containment.

VI–F–5–a. Any institution not otherwise covered by the Guidelines, which is considering submission of data or information voluntarily to NIH, may request presubmission review of the records involved to determine whether, if the records are submitted, NIH will or will not make part or all of the records available upon request under the Freedom of Information Act.

VI–F–5–b. A request for presubmission review should be submitted to ORDA, along with the records involved. These records must be clearly marked as being the property of the institution, on loan to NIH solely for the purpose of making a determination under the Freedom of Information Act. ORDA will then seek a determination from the HEW Freedom of Information Officer, the responsible official under HEW regulations (45 CFR Part 5), as to whether the records involved (or some portion) are or are not available to members of the public under the Freedom of Information Act. Pending such a determination, the records will be kept separate from ORDA files, will be considered records of the institution and not ORDA, and will not be received as part of ORDA files. No copies will be made of the records.

VI–F–5–c. ORDA will inform the institution of the HEW Freedom of Information Officer's determination and follow the institution's instructions as to whether some or all of the records involved are to be returned to the institution or to become a part of ORDA files. If the institution instructs ORDA to return the records, no copies or summaries of the records will be made or retained by HEW, NIH, or ORDA.

VI–F–5–d. The HEW Freedom of Information Officer's determination will represent that official's judgement, as of the time of the determination, as to whether the records involved (or some portion) would be exempt from disclosure under the Freedom of Information Act, if at the time of the determination the records were in ORDA files and a request was received from them under the Act.

Appendix A—Exemptions Under I–E–4

Section I–E–4 states that exempt from these Guidelines are "certain specified recombinant DNA molecules that consist entirely of DNA segments from different species that exchange DNA by known physiological processes, though one or more of the segments may be a synthetic equivalent. A list of such exchangers will be prepared and periodically revised by the Director, NIH, with advice of the Recombinant DNA Advisory Committee, after appropriate notice and opportunity for public comment (see Section IV–E–1–b–(1)–(d).) Certain classes are exempt as of publication of these Revised Guidelines. The list is in Appendix A."

Under exemption I–E–4 of these revised Guidelines are recombinant DNA molecules that are (1) composed entirely of DNA segments from one or more of the organisms within a sublist and (2) to be propagated in any of the organisms within a sublist. (Classification of *Bergey's Manual of Determinative Bacteriology*, eighth edition. R. E. Buchanan and N. E. Gibbons, editors. Williams and Wilkins Company: Baltimore, 1974.)

Sublist A

1. Genus *Escherichia*
2. Genus *Shigella*
3. Genus *Salmonella* (including *Arizona*)
4. Genus *Enterobacter*
5. Genus *Citrobacter* (including *Levinea*)
6. Genus *Klebsiella*
7. Genus *Erwinia*
8. *Pseudomonas aeruginosa*, *Pseudomonas putida* and *Pseudomonas fluorescens*
9. *Serratia marcescens*

Sublist B

1. *Bacillus subtilis*
2. *Bacillus licheniformis*
3. *Bacillus pumilus*
4. *Bacillus globigii*
5. *Bacillus niger*
6. *Bacillus nato*
7. *Bacillus amyloliquefaciens*
8. *Bacillus aterrimus*

Sublist C

1. *Streptomyces aureofaciens*
2. *Streptomyces rimosus*
3. *Streptomyces coelicolor*

Sublist D

1. *Streptomyces griseus*
2. *Streptomyces cyaneus*
3. *Streptomyces venezuelae*

Sublist E

One way transfer of *Streptococcus mutans* DNA into *Streptococcus sanguis*.

Sublist F

1. *Streptococcus sanguis*
2. *Streptococcus pneumoniae*

Appendix B—Classification of Micro-Organisms on the Basis of Hazard

I. Classification of Etiologic Agents on the Basis of Hazard (*1*)

A. Class 1 Agents

All bacterial, parasitic, fungal, viral, rickettsial, and chlamydial agents not included in higher classes.

B. Class 2 Agents

1. Bacterial Agents

Actinobacillus—all species except *A. mallei*, which is in Class 3
Arizona hinshawii—all serotypes
Bacillus anthracis
Bordetella—all species
Borrelia recurrentis, *B. vincenti*
Clostridium botulinum, *Cl. chauvoei*, *Cl. haemolyticum*, *Cl. histolyticum*, *Cl. novyi*, *Cl. septicum*, *Cl. tetani*
Corynebacterium diptheriae, *C. equi*, *C. haemolyticum*, *C. pseudotuberculosis C. pyogenes*, *C. renale*
Diplococcus (Streptococcus) pneumoniae
Erysipelothrix insidiosa
Escherichia coli—all enteropathogenic serotypes
Haemophilus ducreyi, *H. influenzae*
Herellae vaginicola
Klebsiella—all species and all serotypes
Leptospira interrogans—all serotypes
Listeria—all species
Mima polymorpha
Moraxella—all species
Mycobacteria—all species except those listed in Class 3
Mycoplasma—all species except *Mycoplasma mycoides* and *Mycoplasma agalactiae*, which are in Class 5
Neisseria gonorrhoeae, *N. meningitidis*
Pasteurella—all species except those listed in Class 3
Salmonella—all species and all serotypes
Shigella—all species and all serotypes
Sphaerophorus necrophorus
Staphylococcus aureus
Streptobacillus moniliformis
Streptococcus pyogenes
Treponema carateum, *T. pallidum*, and *T. pertenue*
Vibrio fetus, *V. comma*, including biotype El Tor, and *V. parahemolyticus*

2. Fungal Agents

**Actinomycetes (including *Nocardia* species and *Actinomyces species*

and Arachnia propionica)
Blastomyces dermatitidis
Cryptococcus neoformans
Paracoccidioides brasiliensis

3. Parasitic Agents
Endamoeba histolytica
Leishmania sp.
Naegleria gruberi
Toxoplasma gondii
Toxocara canis
Trichinella spiralis
Trypanosoma cruzi

4. Viral, Rickettsial, and Chlamydial Agents
Adenoviruses—human—all types
Cache Valley virus
Coxsackie A and B viruses
Cytomegaloviruses
Echoviruses—all types
Encephalomyocarditis virus (EMC)
Flanders virus
Hart Park virus
Hepatitis-associated antigen material
Herpes viruses—except *Herpesvirus simiae* (Monkey B virus) which is in Class 4
Corona viruses
Influenza viruses—all types except A/PR8/34, which is in Class 1
Langat virus
Lymphogranuloma venereum agent
Measles virus
Mumps virus
Parainfluenza virus—all types except Parainfluenza virus 3, SF4 strain, which is in Class 1
Polioviruses—all types, wild and attenuated
Poxviruses—all types except *Alastrim, Smallpox, Monkey pox, and Whitepox*, which depending on experiments, are in Class 3 or Class 4
Rabies virus—all strains except *Rabies street virus*, which should be classified in Class 3 when inoculated into carnivores
Reoviruses—all types
Respiratory syncytial virus
Rhinoviruses—all types
Rubella virus
Simian viruses—all types except *Herpesvirus simiae (Monkey B virus) and Marburg virus*, which are in Class 4
Sindbis virus
Tensaw virus
Turlock virus
Vaccinia virus
Varicella virus
Vole rickettsia
Yellow fever virus, 17D vaccine strain

C. Class 3 Agents
1. Bacterial Agents
Actinobacillus mallei *
Bartonella—all species
Brucella—all species
Francisella tularensis
Mycobacterium avium, M. bovis, M. tuberculosis
Pasteurella multocide type B ("buffalo" and other foreign virulent strains *)
Pseudomonas pseudomallei *
Yersenia pestis

2. Fungal Agents
Coccidioides immitis
Histoplasma capsulatum
Histoplasma capsulatum var. *duboisii*

3. Parasitic Agents
Schistosoma mansoni

4. Viral, Rickettsial, and Chlamydial Agents
***Alastrim, Smallpox, Monkey pox, and Whitepox*, when used *in vitro*
Arboviruses—all strains except those in Class 2 and 4 (Arboviruses indigenous to the United States are in Class 3, except those listed in Class 2. *West Nile* and *Semliki Forest* viruses may be classified up or down, depending on the conditions of use and geographical location of the laboratory.)
Dengue virus, when used for transmission or animal inoculation experiments
Lymphocytic choriomeningitis virus (LCM)
Psittacosis-Ornithosis-Trachoma group of agents
Rabies street virus, when used in inoculations of carnivores (See Class 2)
Rickettsia—all species except *Vole rickettsia* when used for transmission or animal inoculation experiments
Vesicular stomatitis virus *
Yellow fever virus—wild, when used *in vitro*

D. Class 4 Agents
1. Bacterial Agents: None
2. Fungal Agents: None
3. Parasitic Agents: None
4. Viral, Rickettsial, and Chlamydial Agents
***Alastrim, Smallpox, Monkey pox, and Whitepox*, when used for transmission or animal inoculation experiments
Hemorrhagic fever agents, including *Crimean hemorrhagic fever, (Congo), Junin*, and *Machupo* viruses, and others as yet undefined
Herpesvirus simiae (Monkey B virus)
Lassa virus
Marburg virus
Tick-borne encephalitis virus complex, including *Russian spring-summer encephalitis, Kyasanur forest disease; Omsk hemorrhagic fever*, and *Central European encephalitis viruses*
Venezuelan equine encephalitis virus, epidemic strains, when used for transmission or animal inoculation experiments
Yellow fever virus—wild, when used for transmission or animal inoculation experiments

II. Classification of Oncogenic Viruses on the Basis of Potential Hazard (*3*)

A. Low-Risk Oncogenic Viruses
Rous Sarcoma
SV–40
CELO
Ad7–SV40
Polyoma
Bovine papilloma
Rat mammary tumor
Avian Leukosis
Murine Leukemia
Murine Sarcoma
Mouse mammary tumor
Rat Leukemia
Hamster Leukemia
Bovine Leukemia
Dog Sarcoma
Mason-Pfizer Monkey Virus
Marek's
Guinea Pig Herpes
Lucke (Frog)
Adenovirus
Shope Fibroma
Shope Papilloma

B. Moderate-Risk Oncogenic Viruses
Ad2–SV40
FeLV
HV Saimiri
EBV
SSV–1
GaLV
HV ateles
Yaba
FeSV

III. Animal Pathogens (*3*)

A. Animal disease organisms which are forbidden entry into the United States by Law (CDC Class 5 agents)
1. Foot and mouth disease virus

B. Animal disease organisms and vectors which are forbidden entry into the United States by USDA Policy (CDC Class 5 Agents)
African horse sickness virus
African swine fever virus
Besnoitia besnoiti
Borna disease virus
Bovine infectious petechial fever
Camel pox virus
Ephemeral fever virus
Fowl plague virus
Goat pox virus
Hog cholera virus
Louping ill virus
Lumpy skin disease virus
Nairobi sheep disease virus
Newcastle disease virus (Asiatic strains)
Mycoplasma mycoides (contagious bovine pleuropneumonia)
Mycoplasma agalactiae (contagious

agalactia of sheep)
Rickettsia ruminatium (heart water)
Rift valley fever virus
Rhinderpest virus
Sheep pox virus
Swine vesicular disease virus
Teschen disease virus
Trypanosoma vivax (Nagana)
Trypanosoma evansi
Theileria parva (East Coast fever)
Theileria annulata
Theileria lawrencei
Theileria bovis
Theileria hirci
Vesicular exanthema virus
Wesselsbron disease virus
Zyonema

Footnotes and References of Appendix B

*A USDA permit, required for import and interstate commerce of pathogens, may be obtained from the Animal and Plant Health Inspection Service, USDA, Federal Building, Hyattsville, MD. 20782.

**Since the publication of the classification in 1974 (*1*), the *Actinomycetes* have been reclassified as bacterial rather than fungal agents.

***All activities, including storage of variola and whitepox, are restricted to the single national facility (World Health Organization (WHO) Collaborating Center for Smallpox Research, Center for Disease Control, in Atlanta).

1. *Classification of Etiologic Agents on the Basis of Hazard.* (4th Edition, July 1974). U.S. Department of Health, Education and Welfare, Public Health Service, Center for Disease Control, Office of Biosafety, Atlanta, Georgia 30333.
2. *National Cancer Institute Safety Standards for Research Involving Oncogenic Viruses* (October 1974). U.S. Department of Health, Education, and Welfare Publication No. (NIH) 75-790.
3. U.S. Department of Agriculture, Animal and Plant Health Inspection Service.

Appendix C—Exemptions Under I-E-5

Section I-E-5 states that exempt from these Guidelines are "Other classes of recombinant DNA molecules, if the Director, NIH, with advice of the Recombinant DNA Advisory Committee, after appropriate notice and opportunity for public comment, finds that they do not present a significant risk to health or the environment. (See Section IV-E-1-b-(1)-(d).) Certain classes are exempt as of publication of these Revised Guidelines."

Under exemption I-E-5 of these Revised Guidelines are those recombinant DNA molecules that are propagated and maintained in cells in tissue culture and that are derived entirely from non-viral components (that is, no component is derived from a eukaryotic virus).

Appendix D—HV1 and HV2 Host-Vector Systems Assigned Containment Levels as Specified in the Subsections of Section III-A

As noted above at the beginning of Section III-A, certain HV1 and HV2 host-vector systems are assigned containment levels as specified in the subsections of Section III-A. Those so classified as of publication of these Revised Guidelines are listed below.

* HV1—The following specified strains of *Neurospora crassa* which have been modified to prevent aerial dispersion:
  (1) inl (inositolless) strains 37102, 37401, 46316, 64001 and 89601.
  (2) csp-1 strain UCLA37 and csp-2 strains FS 590, UCLA101 (these are conidial separation mutants).
  (3) eas strain UCLA191 (an "easily wettable" mutant).

HV1—Asporogenic mutant derivatives of *B. subtilis*. These derivatives must not revert to sporeformers with a frequency greater than 10^{-7}; data confirming this requirement must be presented to NIH for certification. The following plasmids are accepted as the vector components of certified *B. subtilis* HV1 systems: pUB110, pC194, pS194, pSA2100, pE194, pT127, pUB112, pC221, pC223, and pAB124. *B. subtilis* strains RUB 331 and BGSC 1S53 have been certified as the host component of HV1 systems based on these plasmids.

HV2—The asporogenic mutant derivative of *Bacillus subtilis*, ASB298, with the following plasmids as the vector component: pUB110, pC194, pSA2100, pE194, pT127, pUB112, pC221, pC223, and pAB124.

Appendix E—Actions Taken Under the Guidelines

As noted in the subsections of Sections IV-E-1-b-(1) and IV-E-1-b-(2), the Director, NIH, may take certain actions with regard to the Guidelines after consideration by the RAC.

Some of the actions taken to date include the following:

1. The following experiment has been approved: The cloning in *B. subtilis*, under P2 conditions, of DNA derived from *Saccharomyces cerevisiae* using EK2 plasmid vectors provided that an HV1 *B. subtilis* host is used.

2. Unmodified laboratory strains of *Neurospora crassa* can be used in all experiments for which HV1 *N. crassa* systems are approved provided that these are carried out at physical containment one level higher than required for HV1. However, if P3 containment is specified for HV1 *N. crassa*, this level is considered adequate for unmodified *N. crassa*. For P2 physical containment, special care must be exercised to prevent aerial dispersal of macroconidia, including the use of a biological safety cabinet.

3. P2 physical containment shall be used for DNA recombinants produced between members of the *Actinomycetes* group except for the species which are known to be pathogenic for man, animals, or plants.

4. Cloned desired fragments from any non-prohibited source may be transferred into *Agrobacterium tumefaciens* containing a Ti plasmid (or derivatives thereof), using a nonconjugative *E. coli* plasmid vector coupled to a fragment of the Ti plasmid and/or the origin of replication of an *Agrobacterium* plasmid, under containment conditions one step higher than would be required for the desired DNA in HV1 systems (i.e. one step higher physical containment than that specified in the subsections of Section III-A). Transfer into plant parts or cells in culture would be permitted at the same containment level (one step higher).

5. *Bacillus subtilis* strains that do not carry an asporogenic mutation can be used as hosts specifically for the cloning of DNA derived from *E. coli* K-12 and *Streptomyces coelicolor, S. aureofaciens, S. rimosus, S. griseus, S. cyaneus,* and *S. venezuelae*, using NIH-approved *Staphylococcus aureus* plasmids as vectors under P2 conditions.

6. *Streptomyces coelicolor, S. aureofaciens, S. rimosus, S. griseus, S. cyaneus, and S. venezuelae* can be used as hosts for the cloning of DNA derived from *B. subtilis, E. coli* K-12 or from *S. aureus* vectors that have been approved for use in *B. subtilis* under P2 conditions, using as vectors any plasmid indigenous to *Streptomyces* species or able to replicate in these hosts by natural biological mechanisms.

7. Certain cloned segments of *Anabena* DNA may be transferred into *Klebsiella* under P2 physical containment.

8. Permission is granted to clone foot-and-mouth disease virus in the EK1CV host-vector system consisting of *E. coli* K-12 and the vector pBR322, all work to be done at the Plum Island Animal Disease Center.

9. Permission is granted to clone the Exotoxin A gene of *Pseudomonas aeruginosa* under P1 + EK1 conditions

* These follow the assigned containment levels as specified in the subsections of Section III-A with one exception. This exception is that experiments involving complete genomes of eukaryotic viruses will require P3 + HV1 or P2 + HV2 rather than the levels given in the subsections of Section III-A.

in *Escherichia coli* K-12 and under P1 conditions in *Pseudomonas aeruginosa*.

10. Permission is granted to return to the host of origin *Helminthosporanium maydis* (race O) DNA which has been cloned in yeast strain SHY2 using the hybrid *E. coli*—yeast plasmid Y1p5. The cloned DNA may be returned to, and propagated in, *Helminthosporanium maydis* at the P2 level of physical containment.

11. Permission is granted to return *Schizophyllum commune* DNA (or yeast DNA) cloned in *Saccharomyces cerevisiae* with YR or 2 mu circle vectors to *Schizophyllum commune*. The cloned DNA may be returned to, and propagated in, *Schizophyllum commune* at the P2 level of physical containment.

12. Permission is granted to return *Wangiella dermatitidis* DNA to *Wangiella dermatitidis* using an HV2 certified *Saccharomyces/E. coli* hybrid vector. The *Wangiella dermatitidis* may be propagated at the P3 level of physical containment.

13. Certain specified clones derived from segments of the Foot-and-Mouth Disease Virus may be transferred from Plum Island Animal Disease Center to the facilities of Genentech, Inc., of South San Fransico, California. Further development of the clones at Genentech has been approved under P1 + EK1 conditions.

14. *Saccharomycopsis lipolytica* may be used as a host for tranformation with defined *Escherichia coli/Saccharomyces cerevisiae* hybrid plasmids and the hybrid plasmids may be used for cloning *S. lipolytica* DNA in *E. coli* and returning the cloned DNA to *S. lipolytica*.

15. Conjugative plasmids or transducing phages may be employed in recombinant DNA experiments when employing *E. coli* as host when a small defined segment of Adenovirus 2 DNA is employed as linker DNA.

16. Permission is granted to introduce DNA segments from aphid transmissible strains into non-aphid transmissible strains of Cauliflower mosaic virus in order to study the factors determining aphid transmissibility.

17. Permission is granted to return *Mucor racemosus* DNA which has been cloned in *Saccharomyces cerevisiae* host-vector systems to *Mucor racemosus*. In addition, permission is granted to transform *Mucor racemosus* with *S. cerevisiae* vectors with or without cloned *S. cerevisiae sequences*. These manipulations may be performed under P2 conditions.

18. *Schizosaccharomyces pombe* DNA may be cloned in *Schizosaccharomyces pombe* using approved HV1 *Saccharomyces cerevisiae/E. coli* hybrid plasmids as vectors under P1 containment conditions.

19. The pyrogenic endotoxin type A (Tox A) gene of *Staphylococcus aureus* may be cloned in an HV2 *Bacillus subtilis* host-vector system under P3 containment conditions.

20. A hybrid plasmid composed of, (1) *E. coli* plasmid pBR325, (2) the origin of replication and transfer genes of *Agrobacterium tumefaciens* plasmid Ti, (3) the thiamine gene of *E. coli*, and (4) *Arabidopsis* DNA, may be transformed into *Agrobacterium tumefaciens* under P1 conditions. The *Agrobacterium tumefaciens* may subsequently be used to introduce the composite plasmid carrying *Arabidopsis* DNA and the *E. coli* thiamine gene into *Arabidopsis* plants under P1 containment conditions.

21. *Chlamydomonas reinhardi* can be used as a host for cloning defined DNA segments derived from *E. coli* and *Saccharomyces cerevisiae* using *E. coli/S. cerevisiae* hybrid vectors under P2 physical containment.

22. *Candida albicans* can be used as a host for cloning *Candida albicans* DNA following propagation of the DNA in *E. coli* K-12 or in *Saccharomyces cerevisiae* employing an *E. coli-S. cerevisiae* hybrid plasmid vector or the yeast 2 micron plasmid.

23. The Rd strain of *Hemophilus influenzae* can be used as a host for the propagation of the cloned Tn 10 tet R gene derived from *E. coli* K-12 employing the non-conjugative *Haemophilus* plasmid, pRSF0885, under P1 conditions.

24. *Zymomonas mobilis* may be used as a host under P2 conditions for transformation by recombinant DNA derived from *Pseudomonas* strains that are non-pathogenic for animals or plants, and that has been cloned in an *E. coli* K-12 host.

25. Protoplasts of *Streptosporangium brasiliense* may be transformed with a hybrid plasmid containing pBR322 plus a *Streptosporangium* plasmid into which have been incorporated specified DNA segments from *Streptomyces* species or an HV1 approved *Bacillus subtilis* cloning vector.

Appendix F—Certified HV2 Host-Vector Systems

While the Guidelines no longer specify the use of *E. coli* K-12 EK2 or *Saccharomyces cerevisiae* HV2 systems, investigators may wish to employ these systems in specific instances. The currently certified EK2 and HV2 systems are:

HV2—The following sterile strains of *Saccharomyces cerevisiae*, all of which have the ste-VC9 mutation, SHY1, SHY2, SHY3, and SHY4. The following plasmids are certified for use: YIp1, YEp2, YEp4, YIp5, YEp6, YRp7, YEp20, YEp21, YEp24, YIp25, YIp26, YIp27, YIp28, YIp29, YIp30, YIp31, YIp32, and YIp33.

EK2 Plasmid Systems. The *E. coli* K-12 strain chi-1776. The following plasmids are certified for use: pSC101, pMB9, pBR313, pBR322, pDH24, pBR327. The following *E. coli/S. cerevisiae* hybrid plasmids are certified as EK2 vectors when used in *E. coli* chi-1776 or in the sterile yeast strains, SHY1, SHY2, SHY3 and SHY4: YIp1, YEp2, YEp4, YIp5, YEp6, YRp7, YEp20, YEp21, YEp24, YIp25, YIp26, YIp27, YIp28, YIp29, YIp30, YIp31, YIp32, YIp33.

EK2 Bacteriophage Systems. The following are certified EK2 systems based on bacteriophage lambda:

Vector	*Host*
-gt*WES.-B*	DP50*supF*
-gt*WES.-B*'	DP50*supF*
-gtZ]*vir.-B*	*E. coli* K-12
-gtALO.-B	DP50*supF*
Charon 3A	DP50 or DP50*supF*
Charon 4A	DP50 or DP50*supF*
Charon 16A	DP50 or DP50*supF*
Charon 21A	DP50*supF*
Charon 23A	DP50 or DP50*supF*
Charon 24A	DP50 or DP50*supF*

Dated: November 14, 1980.

Donald S. Fredrickson,

Director, National Institutes of Health.

OMB's "Mandatory Information Requirements for Federal Assistance Program Announcements" (45 FR 39592) requires a statement concerning the official government program contained in the *Catalog of Federal Domestic Assistance*. Normally NIH lists in its annoucements the number and title of affected individual programs for the guidance

of the public. Because the guidance in this notice covers not only virtually every NIH program but also essentially every federal research program in which DNA recombinant molecule techniques could be used, it has been determined to be not cost effective or in the public interest to attempt to list these programs. Such a list would likely require several additional pages. In addition, NIH could not be certain that every federal program would be included as many federal agencies, as well as private organizations, both national and international, have elected to follow the NIH Guidelines. In lieu of the individual program listing, NIH invites readers to direct questions to the information address above about whether individual programs listed in the *Catalog of Federal Domestic Assistance* are affected.

NIH programs are not covered by OMB Circular A-95 because they fit the description of "program not considered appropriate" in Section 8-(b)-(4) and (5) of that Circular.

[FR Doc. 80-36316 Filed 11-20-80; 8:45 am]
BILLING CODE 4110-08-M

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CAMBRIDGE CITY COUNCIL

CITY HALL, CAMBRIDGE, MASSACHUSETTS 02139

(617) 498-9094

Alfred E. Vellucci
City Councillor

Mayor
1970-1971
1976-1977

February 23, 1981

The Honorable, the City Council:

I am transmitting to you the proposed Recombinant DNA Ordinance, as was sent to me by Mr. Hayes, Chair of the Cambridge Experimentation Review Board.

I recommend that the Ordinance be sent to the Ordinance Committee for a public hearing.

Very truly yours,

Alfred E. Vellucci
Chairman
Health and Hospital Committee

AEV/smc

Comm. from Councillor Alfred E. Vellcci, Chairman, Comm. on Health & Hospitals, transmitting a copy of the proposed amendment to the General Ordinances relative to Recombinant DNA Technology.

In City Council,

February 23, 1981

Referred to the Comm on Ordinances for Hearing

Copy sent to Ordinance Committee 2/24/81 (dl)

/

HARVARD UNIVERSITY

ROBIN SCHMIDT
Vice President

MASSACHUSETTS HALL
CAMBRIDGE, MASSACHUSETTS 02138
617-495-1703

March 23, 1981

Councillor David Wylie, Chairman
Committee on Ordinances
Cambridge City Council
Cambridge City Hall
Cambridge, Massachusetts

Re: "Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge"

Dear Councillor Wylie:

The proposed ordinance governing the use of recombinant DNA technology in Cambridge mandates the acquisition of a permit to conduct such research. This ordinance and the permit requirement have been reviewed by the Harvard Institutional Biosafety Committee and University officials. Should the ordinance be approved as written, we understand that application for a permit to continue recombinant DNA research activities will require written agreement that the following conditions will be met:

1) Work will be conducted in conformity with the NIH Guidelines, Administrative Practices Supplement and the NIH Large-Scale Physical Containment requirements.

2) Procedures will comply with the Cambridge City Ordinance.

3) Inspection of facilities and pertinent records will be allowed.

4) A health and safety manual will be used.

5) There will be a training program which covers safeguards and procedures for personnel using recombinant DNA molecules.

The requirements described above have for some time been a part of our operating procedures. Since passage of the Ordinance in February 1977, Harvard has required that all recombinant experiments be conducted in compliance with its provisions. Compliance with the NIH Guidelines and the Administrative Practices Supplement is mandated for all recombinant DNA research at the University by our receipt of funding from the National Institutes of Health. Should the University decide to permit the large-scale use of this technology, all work would be carried out in conformity with NIH requirements. Members of the Cambridge Biohazards

Committee have in the past and will in the future be encouraged to visit our laboratories. Information relevant to the conduct of their committee activities will continue to be made available to them. The University has on file with this committee two manuals which contain information relevant to the safe conduct of recombinant DNA research at the P1, P2 and P3 containment levels. These manuals also outline training requirements mandated by the Harvard Institutional Biosafety Committee.

Harvard University supports the ordinance as proposed. Should the ordinance be approved in its current form, the University will submit to the Commissioner of Health and Hospitals a formal application requesting a permit to conduct recombinant DNA research.

Sincerely,

Robin Schmidt

RS:mr

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RS:mr

C. C. 106

City of Cambridge

NOTICE OF PUBLIC HEARING

The Committee on Ordinances, comprised of the entire membership of the City Council, will hold a public hearing on Tuesday, March 24, 1981 at 5:00 p.m. in the City Council Chamber on a proposed amendment to the General Ordinances of the City of Cambridge relative Recombinant DNA Technology.

All interested individuals are invited to attend and be heard at this time.

For the Committee,

Councillor David A. Wylie,
Chairman.

Administrative Practices Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules

November 1980

Prepared by the
Office of Recombinant DNA Activities
National Institute of Allergy and Infectious Diseases
National Institutes of Health
Bethesda, Md. 20205

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
National Institutes of Health

ADMINISTRATIVE PRACTICES SUPPLEMENT

POLICIES AND ADMINISTRATIVE PROCEDURES FOR
RECOMBINANT DNA RESEARCH SUBJECT TO THE NIH GUIDELINES

This Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules applies only to recombinant DNA research subject to the Guidelines as revised in November 1980 and thereafter by the Director, NIH (See Section I-E of the Guidelines for exempt experiments). This Supplement supersedes the Supplement dated April 1980. In cases in which the instructions in this Supplement differ from those in Public Health Service grant application kits, the instructions in this Supplement take precedence.

I. INSTITUTIONAL BIOSAFETY COMMITTEE

Each Institution involved in the conduct of recombinant DNA research subject to the Guidelines must have a standing Institutional Biosafety Committee (IBC). Requirements and recommendations for the composition of such a committee are discussed under Part IV of the Guidelines, which also discusses the roles and responsibilities of Principal Investigators (PIs) and Institutions.

A roster of the members of the IBC shall be submitted to the Office of Recombinant DNA Activities (ORDA). This must include the names, addresses, occupations, qualifications, and curricula vitae of the chairperson and members of the committee. The information should be addressed to:

Office of Recombinant DNA Activities
National Institutes of Health
Building 31, Room 4A52
Bethesda, Maryland 20205

The membership of IBCs is subject to review by ORDA for compliance with requirements stated in the Guidelines. The Institution shall report promptly to ORDA any changes in this information.

ORDA will assist in the formation of an Area Biosafety Committee (ABC) when appropriate. Such a committee, composed of members from the Institution and other organizations beyond its own staff, may be necessary as an alternative to an IBC when additional expertise from outside a given Institution is necessary for the IBC to fulfill its functions.

II. REGISTRATION OF EXPERIMENTS

Recombinant DNA research subject to the Guidelines must be registered with the IBC in accordance with the requirements stated in Part III of the Guidelines.

IBCs are required to keep records of recombinant DNA research conducted at their institution. IBCs should maintain a record of the frequency of disagreement between the principal investigator and the IBC in the classification of experiments.

III. CHECK BOX AND NOTATION ON APPLICATIONS FOR RESEARCH, TRAINING, AND RESOURCE GRANTS

For competing and noncompeting applications (all series) involving recombinant DNA research subject to the Guidelines, the box "YES" under "RECOMBINANT DNA RESEARCH SUBJECT TO NIH GUIDELINES" is to be checked. No additional information for registration of the recombinant DNA aspects of the proposal need be submitted to NIH.

If the application form does not have the above-mentioned check box, the following statement should be typed at the bottom of the face page of the application:

RECOMBINANT DNA RESEARCH SUBJECT TO NIH GUIDELINES

IV. ACTIVITIES REQUIRING PRIOR NIH APPROVAL

A. Containment Levels Not Specified by the Guidelines. The setting of containment levels for projects for which containment levels are not explicitly specified by the NIH Guidelines or NIH will require review by NIH, usually involving recommendation by the Recombinant DNA Advisory Committee (RAC). Hence, investigators are urged to provide to ORDA, in writing, full information on the proposed experiments prior to submission of a registration document to the IBC.

B. Requests for Exceptions and Exemptions. Requests for an exception to a prohibition or an exemption from the Guidelines must be submitted to ORDA, with adequate documentation. Because the handling of requests for exceptions and exemptions will involve review by the RAC with provision for public comment, investigators are urged to discuss the proposal with ORDA before submitting a formal request. Decisions on requests for exceptions or exemptions will be published in the Federal Register and the Recombinant DNA Technical Bulletin.

V. POLICY AND PROCEDURES FOR RECOMBINANT DNA RESEARCH SUPPORTED BY NIH AND CONDUCTED IN FOREIGN COUNTRIES

A. Requirements Regarding Countries That Have Adopted Guidelines. Many countries in which NIH-supported recombinant DNA research may be conducted have adopted guidelines for this research which are either comparable to or based on principles similar to those of the NIH Guidelines. Also, many countries have organizations and procedures to review and register recombinant DNA research. If such comparable guidelines and procedures exist, then review and approval by the appropriate body will, in general, be accepted as assurance that the research will be conducted in a responsible manner. Applicants should provide such assurance of compliance in the application. NIH reserves the right, however, to withhold funding if the safety practices to be employed are not reasonably consistent with the NIH Guidelines.

B. Requirements Regarding Countries That Have Not Adopted Guidelines.

NIH funds may not be used for the conduct of recombinant DNA research in a country that has not adopted national guidelines unless there is assurance that the research will be conducted in compliance with the NIH Guidelines.

Democratic coalition in disarray

By PEGGY SIMPSON
Herald American Washington Bureau

WASHINGTON — President Reagan is expected to score an early legislative victory this week with probable House approval of his plan to cancel an April 1 increase in dairy price supports.

The administration says this would save $147 million.

Initially, a House agriculture subcommittee voted to save the price supports by a 7-6 vote. But after the White House applied pressure, even farm-state Republicans swallowed their disagreement and went along with Reagan in the full committee.

This could have been one of the first tests of strength between the House Democrats and the Reagan administration. But it won't be, partly because the Reagan pressure has whipped defectors back into line but also because Democrats are divided.

The traditional coalition between city and farmer legislators that helped Democrats push through many social programs of the last two decades needs substantial repair.

"It used to be that consumers went with you on such issues as dairy price supports even though it increases consumer prices on milk and cheese and you supported them on inner city issues," said one Democratic policy analyst. "But when conservative farmers went out and voted against the Consumer Bank, (which Reagan plans to kill) that was it for many liberals. They're using the dairy price support bill to bargain for future support of big-city issues but they're not automatically for it."

With five major farm bills due up this year, and with a plethora of big city social programs endangered, "the liberals in the cities and the farmers have to get together.

Washington Letter

If not, they're both down the drain. If they do, issues affecting both can pass" he said.

The congressional debate over the dairy price support bill highlights another problem, too. Reagan's proposal was in such shaky shape in the Senate that a final vote has been postponed twice, with Democrats showing enough strength on a test vote to pass a crippling amendment.

This is testimony not so much to the Democrats' clout but to poor preparation by Agriculture Sec. John Block. It was a month after Reagan's much ballyhooed announcement on the dairy support curtailment before Congress got full details — and despite many requests still has not gotten Block to say how the dairy farmers will fare in Reagan's overall farm bill due out later this spring.

Block has been contributing his share to the general picture of a less than fully informed array of cabinet secretaries surrounding Reagan. Last week, when asked about the grain embargo to the Soviet Union, Block astounded reporters by saying he didn't see anything wrong with free trade. What was wrong with letting grain dealers sell all they could to the Soviets?

Reminded of the circumstances of extreme shortages domestically because of massive sales to Russia some years back, which led to export controls, Block ultimately came around to saying he might have been flamboyant in his initial statement. But, for most persons present, his gut reaction was typical of the big business no-holds-barred mentality of much of the cabinet.

Just how far the bloc of 44 conservative Democrats will push House Speaker Thomas P. O'Neill has yet to be shown.

But they already are winning some concessions that anger their colleagues. Many committees had put in for more money, some of it possibly to be used to hire investigators who could keep track of Reagan agencies.

Rep. Barbara Mikulski, D-Md., was one of those arguing for more committee funds, in this case for Interstate Commerce. She was aghast several days after winning that fight within the Democratic ranks on the committee to be told by a leader of the conservatives, Rep. Phil Gramm of Texas, that he'd beaten her ultimately: he had gotten O'Neill to agree with a 10 percent reduction in all committee authorization.

O'Neill gave the conservatives their cutback wish in order to prevent something worse. Republicans contend a cutback in authorizations is meaningless, that only a cutback below actual spending levels of last year would count.

Sen. Edward M. Kennedy is guaranteed clout high in the ranks of the newly invigorated Democratic National Committee. Two of the top three staff jobs filled by Chairman Charles Manatt have strong Kennedy ties: Ann Lewis, as political director, and Ronald Brown as chief counsel.

Lewis, considered one of the most astute political organizers in the party, has deep roots in Boston where she once worked for the mayor and has been top aide to Rep. Barbara Mikulski, D-Md., one of Kennedy's most energetic supporters in his 1980 presidential campaign.

Brown, who is said to have aspirations to run for mayor of Washington, D.C., was a top activist in the Kennedy campaign and has been general counsel for the senator since then.

The third person, Eugene Eidenberg, handled New England issues for President Carter along with other duties on the Domestic Policy Staff. He will be committee director at the DNC.

Staff Photo by Angelo Kaloventzos

Models ranging in age from 27 to 75, members of the Boston chapter of Reach to Recovery display spring fashions at John Hancock Hall.

There's life after a mastectomy

By PAUL SULLIVAN
Staff Writer

When Anne Wheldon of Norwood was told she had breast cancer and had to have a mastectomy, she thought: "I wanted to go on with my life and nothing would stop me.

"I would give up a little to see my daughters grow up. I had a lot of fun to have yet.

"If anything, it's not what you have — it's what you do with what you have."

And Anne Wheldon had fun yesterday doing, for her, the unusual — modeling the latest in spring fashions from Saks Fifth Avenue at John Hancock Hall.

She was one of 14 models, age 27 to 75, all members of the Boston chapter of Reach to Recovery, modeling clothes — but more importantly showing women who have had mastectomies that they can lead a normal life.

Or as Recovery spokeswoman Kathy Masterson explained: "To make women who have had mastectomies feel they can look fantastic in clothes they wear off the rack. To make them feel sexy again . . . and they can look great in a bathing suit."

According to the American Cancer Society, about 3,000 women a year in Massachusetts are struck with breast cancer.

The Society says 85 percent of all cases can be cured if detected early.

Betty Rollin, author of "First, You Cry" and an NBC-TV correspondent on leave from her job, spoke to the audience before the fashion show.

"If you've had cancer," she said, "you're going to be a little afraid the rest of your life. This is not pleasant but it is useful because you go about your life better.

"I've done less putting off of things I want to do. You get your priorities more in order.

"Everyone knows life is going to end but if you've had cancer, you know it better."

Reach to Recovery members often visit hospitals to cheer up and comfort those who are about to have or have had a mastectomy.

Rollin said: "It's good to be surrounded by people who have been through what you've been through . . . who have survived . . . who are useful."

"I'm sure a lot of these women when they first got hit, never thought they'd have a good time today," she added.

Meanwhile the women modeling clothes walked down a runway to the recorded sounds of Blondie's "Call Me," "Do You Think I'm Sexy" and "The Stripper."

Model Bertha Boyajian of Wellesley said of the fashion show: "it's the best thing for anyone. It gives them hope. It shows they can wear anything off the shelf."

Phyllis Fox of Newton said of the Recovery members who visit women in hospitals: "We give hope and encouragement. When a husband or mother sees us standing there, it gives them a sigh of relief . . . to see someone who has recovered from a mastectomy.

"We just give support."

Judi Havens of Mattapoisett said: "I feel I show other women it's a disease you can cope with. Women are surviving it — and surviving happy."

Striking Island guards face disciplinary action

John Seay, Penal Commissioner of Deer Island House of Correction, said yesterday that disciplinary action will be taken against guards who participated in the work stoppage.

Seay did not specify what action.

Members of Local 419 of the Association of Federal, State, County and Municipal Employees walked off the job around 11 p.m. Friday in protest of stalled wage talks in their contract negotiations.

A Boston Police spokesman said yesterday about two dozen police officers were filling in for the striking guards. Deputy Superintendent Martin F. Mulcern said the prison was operating under a regular Sunday schedule.

"It's quiet," he said, "It's running normal. They're (the convicts are) having a regular Sunday schedule. They had their showers, ate breakfast as usual and are making phone calls to their families."

The prison, which has 322 inmates, is usually staffed by 45 guards. Officials said inmates were allowed to leave their cells to eat lunch, as usual, but they were barred from receiving visitors due to the job action.

William Murphy, deputy master of the jail, said all programs in the prison have been running as scheduled.

The guards, who have been working without a contract for nine months, are seeking a 7 percent pay hike over a two-year period. The city has offered a 5 percent increase.

City Council seen key to Hub schools' fate

The fate of Boston's schools is in the hands of City Council members who must decide whether or not to endorse Mayor Kevin White's proposal to free city funds for the School Department.

White has proposed releasing $18 million in city funds for spending by the School Department by getting authorization for a $90 million bond issue to pay court ordered property tax abatements.

"The council holds the trump card, and they can determine the fate of the schools," Michael Donovan, a White aide said yesterday.

White's proposal, which requires approval of the Legislature and governor, also calls for new, increased taxes to pay off the bond debt.

In an effort to get his bill approved, White has said he would drop his proposed takeover of the School Committee's budget. He has also abandoned plans for a $90,000 dining room, according to aides.

City Council President Patrick McDonough has filed his own proposal which would require the city to borrow $30 million on the bond market to make up the projected revenue gap threatening to shut down the schools next month.

"We'd be happy to see ither one pass," School Committee member Jean Sullivan McKeigue said.

"But we know very well that the council is so angry with the mayor that they're not willing to help him along the way. I just hope we can come to together and reach an accomodation so that the schools will not be held hostage," she said.

Garage security sought

Boston City Councilor Raymond L. Flynn said yesterday that he will file a bill Wednesday that would require all leases between the city and private garage management companies to include security precautions.

Flynn said he decided to file legislation after a public hearing Thursday with representatives of the City's Real Property Department and concerned patrons of municipally-owned garages.

In recent weeks several patrons at these garages, particularly the St. James Street facility, have been attacked while returning to their cars.

One victim, an airline executive, was stabbed 13 times.

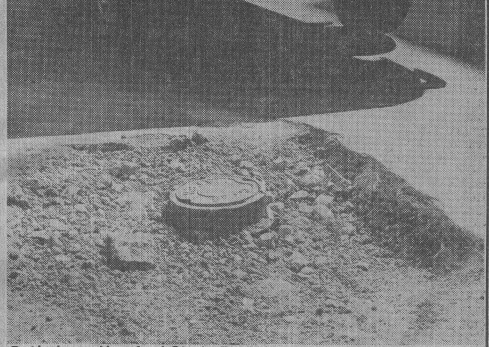
"The lack of adequate lighting and trained security guards," Flynn said, "has created an open invitation for criminals to terrorize patrons in Boston municipal garages.

"The city should not wait for even more tragedies to occur before it takes action to protect the public safety of the thousands of people who regularly use the garages when they come into the downtown area to work, shop or for entertainment," he said.

Flynn said requiring effective security and monitoring procedures in the city's lease agreements "is the surest way of reducing crime in municipal garages."

Presently the city is paying the cost of two armed security guards at the St. James Street garage pending renegotiation of the lease.

TODAY'S POTHOLE



Pothole on Hereford St., in Back Bay.

Today's Pothole of the Day award goes to a foul front-end twister on Hereford Street in the Back Bay.

This square-shaped pit is six inches deep, 40 inches long and three feet wide. It's filled with rocks, broken glass and litter. Rising from the rubble is a rusted pipe capable of puncturing most tires.

If you'd like to become part of the Herald American's Pothole Patrol, send the location of the pavement pit that annoys you the most to the Pothole Editor, Boston Herald American, 300 Harrison Ave.,Boston 02106.

Delay for Medicaid plan

State Human Services Sec. Charles F. Mahoney says it may now be too late for his proposed cost saving Medicaid plan to be in place by the beginning of the new fiscal year, July 1.

But Mahoney said he remains optimistic that necessary federal waivers, legislative approval and cooperation from doctors and hospitals will be forthcoming in time to implement the fixed budget program some time during fiscal 1982.

According to aides, each day's delay beyond July 1 will cost $650,000 of savings projected for the full year. The savings, the King administration has indicated, would make more money available for local aid — increases the cities and towns want to help them cope with Proposition 2½.

The plan would end the present system, budgeted at $1.076 billion in fiscal 1982. Under that system, medical services are provided and bills are submitted to the state afterward.

The fixed budget concept, aimed at cost savings through forced efficiences, would operate as a pre-payment plan. Doctors and hospitals, known as medical vendors, would provide services at a fixed monthly fee. If their costs exceed the fee, they would suffer a loss, and they would make a profit if the fee exceeds their costs.

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Charter changes ruffle feathers

By BILL DOOLEY
Staff Writer

"There is many a slip twixt the cup and the lip," as the old saying goes — and apparently there were several slips in the proposed City Charter change between the time it was approved by the Board of Aldermen and the time it received its hearing by the Legislature. Some elected officials are crying "foul," saying that the proposed new charter should have been presented "exactly as it was approved by the aldermen."

It really wasn't fowl, "but a few of the feathers had to be smoothed before it could be heard on Beacon Hill," said one veteran political observer. "In the old days, local officials would take a proposed charter change to the Legislature and they would draft it in the language only spoken on Beacon Hill. It was drafted where it would finally be approved — but the new breed of local politicians feel they know enough to do it themselves."

When the proposed charter change was heard by the Legislature there were noticeable changes made from what had been approved by the aldermen, and this touched off a heated debate. The charter was returned to the aldermen and they met last week and changed the language.

"Like always, a little hell can be raised where there are changes but there doesn't appear to have been any hanky panky — just not checking the facts and the language caused the problems," the veteran politician said. "Just a little fuel for the political fires."

Coalitions are being formed to try to get the cities and towns, as well as the state government, to understand what the voters wanted when they approved Proposition 2½. The voters wanted the fat cut out of the costs of operating governments — city, county and state.

There will be a march on Saturday, March 28, at the State House to try to get the message understood. Voters are saying that the only reaction to Proposition 2½ is by cities and towns that are planning to cut city services — not the fat. The state is asking where it is expected to get additional funds to aid cities and towns — and the voters plan to tell them to cut the fat. It simply appears that everyone is chewing . . . what they should be cutting.

There is expected to be a large turnout of police officers at Cambridge City Hall today as the council is to hear from the Police Association on the subject of pay raises. The meeting is scheduled for 5:30 p.m. Proposed layoffs of police employees may also be discussed.

A Charlestown youth complained to Cambridge police that he had been taken for $15, but the investigation might turn up something that he might regret.

The youth told police he offered a man $15 to buy him a case of beer. The man took the $15 and went into a liquor store. He came out with the beer, but instead of giving it to the youth he placed in his automobile.

The young man demanded the beer but was told, "Back off before I get out and take the rest of your money," before putting the car in gear and driving off. Maybe the youth learned a lesson — but when he went to the police to report being taken, he wasn't too smart either — because he wasn't old enough to have beer in the first place.

Taking part in annual Clergy day at New England Rehabilitation Hospital, Woburn, for clergy from wide radius of cities and towns, was Dr. Bessie Chambers (left) of Episcpal Divinity School, Cambridge, and Carole Bohn of Cambridge, chaplain at the rehab Hospital. The all-day program was sponsored by the Hospital Department of Pastoral Care.

Security guard aids woman attacked by former husband

A security guard in an apartment building at 312 Rindge Ave., Cambridge, is credited with possibly saving the life of one of the tenants when she was attacked Saturday by her former husband.

Security guard James Turner heard the woman's call for help as she was being dragged and kicked along a hallway in the building.

He called the police and went to the aid of Elizabeth G. Sorenson.

When Cambridge police officer Frank Pasquarello arrived, the woman was bleeding from the face and neck, and her former husband, Manuel V. Gomez Jr., 45, was still in the hallway.

Officer Pasquarello said the woman's neck bore fingernail scratches and that she was bleeding profusely from cuts and scratches on her face.

The woman told police her husband had come to her apartment, knocked her down and attempted to strangle her. As he began dragging her down the hallway she broke loose and screamed for help, which brought Turner and officer Pasquarello.

Both officers talked to Gomez, who reportedly said he was going to kill her, "no matter what police did."

Gomez was arrested and charged with assault with intent to murder, assault and battery with a shod foot, assault and battery and being in violation of a restraining order obtained to keep him away from his wife.

Ms. Sorenson was taken to Cambridge Hospital where she was treated for her injuries and held for observation.

Pinocchio sub shop owner beaten, robbed

The owner of a popular Harvard Square/sandwich shop was reportedly kidnapped, assaulted, beaten and robbed yesterday by two men wearing nylon stocking masks.

The police said, Matarazzo Luciano, owner of Pinocchio's Sub Shop on Winthrop Street told them he was returning home shortly after 4 a.m. when he was grabbed.

Luciano told the police that he noticed a silver-colored older model Thunderbird pull up alongside his car as he was parking on Worthington Street.

He told the police that as he attempted to get out of his car, the two men, one armed with a chromed .45 calibre automatic pistol ordered him into the trunk of their car.

While being driven around, Luciano said he attempted to force open the automobile's trunk but did not succeed.

Luciano reported that the two men drove him to Cooledge Hill Road, let him out of the trunk and forced him into Cambridge Cemetery.

Once inside the cemetery, Luciano told the police that two men began beating him with baseball bats, telling him, "You had better sell your place."

Luciano told the police that he faked unconsciousness and the two men rolled him over and took his wallet and fled.

Luciano was taken to Mount Auburn Hospital and later transfered to Brigham and Women's Hospital.

The case is being investigated by Lt. Edwin Petersen of the detective bureau who will assign detectives to talk with Luciano as soon as his condition permits.

Knife-wielding youth stabs motorist stopped at corner

The Cambridge police are investigating the stabbing of a motorist early yesterday at the intersection of Allston and Brookline streets.

Police said Hugh Norton of Peter Street was stopped at the intersection when a youth ran up to the automobile and stabbed him in the left arm and leg.

Norton told police the man didn't say anything and there is no apparent motive for the stabbing.

Norton managed to drive his car to report the incident.

The knife-wielding man was described as a white male about 17 years old wearing a leather jacket.

In another stabbing incident over the weekend, DanielCornelio of Charles Street was slashed on the hand as he attempted to speak to a man he saw talking to his 10-year-old daughter.

Cornelio told the police he looked out of his window and saw a man between 21 and 25 years of age talking to his daughter near their home.

As Cornelio attempted to speak to him the man turned and ran. Cornelio gave chase in his car and stopped him on Otis Street.

Cornelio told the police that when he approached, the man suddenly pulled a knife, slashed Cornelio on the hand and fled.

The alleged assailant was described as a white male with a chunky build, wearing a beige hat, jacket and pants.

Assaults, including robbery, probed by Somerville police

The Somerville police are investigating a series of weekend assaults, including an armed robbery.

Mary Shattuck, 29, of Florence Street was taken to Somerville Hospital for treatment of facial injuries after reportedly being assaulted by three youths near her home.

Three youths also allegedly assaulted Linda Gagon, 16, of Marshall Street, while she was walking in Union Square shortly after midnight.

Edward Mederious, 31, of Vinal Avenue told the police he was assaulted by three youths on Bow Street and reported his glasses were broken in the attack.

Twenty-two year old Thomas R. Oliverio of School Street received minor injuries when he was reportedly pulled from his automobile and beaten by three youths at Broadway and Temple Street shortly after 1 a.m. on Saturday.

Edward Hayes of Cedar Street told the police that he was assaulted and robbed in the driveway of his home Saturday night by two youths. One youth, he said, held a knife while the other punched him in the face and made off with his wallet containing $80 in cash and personal papers.

A 22-year-old woman was found unconscious at Broadway and Mount Vernon STreet shortly after 3 a.m. yesterday and it was not immediately known if she was as assault victim. She was identified at Cambridge Hospital as Cynthia McRee of 32 Pearl Street.

Appeal to moped thief

Cambridge police are appealing to a thief to return a three-wheel moped stolen on Elm Street over the weekend.

Police said the three-wheel vehicle was taken from the rear yard of Ernest L. Sousa of 169 Elm St., who is handicapped. The moped is Sousa's only means of transportation.

Anyone knowing the whereabouts of the three-wheeled moped are asked to call the Cambridge Police at 498-9300.

Fish market owner calls would-be robber's bluff

Nothing fishy goes on in Frank's Fish Market on Holland Street in Somerville.

Owner Frank LaVita doesn't believe everything he is told and when a bandit says, "I want all the money in the register," he better have something to back himself up with.

DeVita was in his shop at 7:35 p.m. on Friday when a man wearing a gray hooded sweatshirt entered and demanded the money.

The would-be robber was described as about 25 years of age with a cut over one eye.

When he demanded the money, he held one hand under his sweatshirt as if he had a weapon. LaVita didn't believe him and ordered him out of the shop.

The would-be bandit ran from the store and fled in a white Cadillac sedan.

Vandals smash windows

Vandals went on a rock-throwing spree along Broadway in Somerville early yesterday, damaging at least six business establishments.

Tanners at 690 Broadway had a glass door smashed while another four by six foot glass door was reported broken at Kosta's Family Store at 851 Broadway.

A three by five foot plate glass doors were smashed at the Charles Realty Co. at 964 Broadway, along with several windows at Knox Brothers at 694 Broadway.

Two windows were smashed at the Arco service station, 620 Broadway, and the Somerville Family Protective Service at 1020 Broadway also had broken windows.

School board to meet

The Somerville School Committee will hold a special meeting at 7 p.m. Thursday to discuss budget and financial matters.

The committee expects to hear from Mayor Eugene Brune what effect the reduction of more than $1 million in state education funds will have on the school administration.

Brune received word last week that the city will get $1,024,000 less than anticipated from the state in its cherry sheet figures, and school officials are concerned over the effects on the school budget.

Proposed Ordinance Amendments

3/24/81

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

AN ORDINANCE

In amendment to an Ordinance formerly entitled "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by striking out the present Article II and substituting in place thereof a new Article II entitled "ORDINANCE FOR THE USE OF RECOMBINANT DNA TECHNOLOGY IN THE CITY OF CAMBRIDGE" which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. Guidelines for the Regulation of Recombinant DNA use.

I. Definitions

In the context of this ordinance the following definitions are adopted:

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the NIH Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

3) Administrative Practices Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

#1 4) Such amendments to 1, 2, and 3 above as may be approved by the Cambridge Biohazards Committee. Adopted by the National Institute of Health

II. Purpose

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. Cambridge Biohazards Committee

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

IV. Permit Requirement

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manual which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

2/ Required by the National Institutes of Health Guidelines

V. The Institutional Biosafety Committee (IBC) mandated by the "Guidelines" shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

Strike out Hans Lang

X. The premises in which RDNA is used must be effectively free of rodent and insect infestation.

3.

Section 11-8. Large Scale

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. Special Permit

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved the the CBC

and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

3) The institution shall reimburse the City for the expense of this inspection and review.

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic re-training and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. Cambridge Biohazards Committee (CBC)

I. Specific responsibilities of the CBC shall include:

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

b) Approving all amendments to the "Guidelines" before their implementation in Cambridge.

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. Restrictions

RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

Section 11-11. Penalties

Check the legality of fine with City Solicitor

5

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply to the extent feasible).

4

Section 11-12. Severability of ~~Sections~~ Substitute strange language here

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

City of Cambridge

In City Council March 30, 1981

The Ordinance *Committee*
comprised of the entire membership of the City Council
to which was referred a proposed amendment to Chapter Eleven, Article II, Section 11-7 through 11-9 of the General Ordinances of the City of Cambridge, entitled Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge met on Tuesday, March 24, 1981 at 5:13 p.m. in the City Council Chamber.

Councillor David A. Wylie, Chairman of the committee presided.

The Chairman called for the proponents to come forward to be heard.

The Committee heard from Daniel J. Hayes, Jr., Chairman of the Cambridge Experimentation Review Board which had held joint meetings with the Cambridge Biohazards Committee to draft changes to the present DNA ordinance.

Mr. Hayes introduced the DNA Experimentation Review Board Committee members who were present in the Chamber: Dr. John L. Brusch, Kenneth Daly, Mrs. Constance Hughes, Mrs. Mary Nicoloro, Mrs. Constance Wheeler and Dr. Robert Neer; Elsa Stern and Oliver Farnum of the Biohazards Committee and the Health Policy Board.

The Committee heard from Dr. Robert Neer who outlined the proposed amendment and stressed the need for a revised ordinance due to the large scale DNA usage and proposed commercial applications. He stated that the joint committee sessions brought together those who would set policy and those who would be engaged in the processing; that the regulations were directed towards events that could happen; that NIH guidelines were incorporated by reference to regulate the commercial activity which was anticipated.

In answer to questions by Councillor Vellucci he stated that the City Council could add regulations to those prepared by the NIH.

Daniel J. Hayes stated that the revision would provide for a permit system; that the present ordinance did not contain provisions for permits; that two kinds of permits were contemplated by the amendment for both small and large scale operations in accordance with guidelines set by NIH.

REPORT

Committee on Ordinance

Recombinant DNA Technology Ordinance.

In City Council,

March 30, 1981

3/30/1981

- Passed to 2nd Reading -

The Committee heard from Sheldon Krimsky of the CERB who also serves as a member of NIH Recombinant DNA Advisory Committee who stated that the potential risks of DNA technology were far less today than they were five years ago and stressed the need to establish the regulations to control the commercial applications which requires large amounts of recombinant DNA as distinguished from the Harvard and MIT Laboratories which use small amounts in their research.

Dr. Neer stated that the proposed ordinance would enable the City to keep in touch with the increased increase in experimentation and would require institutions doing large scale work to reimburse the City for inspections, to train workers and prepare a safety manual, provide medical surveilliance of personnel and advance approval for all large scale work at the higher P2 and P3 containment levels.

The Committee received a letter from Robin Schmidt, Vice-President of Harvard University dated March 23, 1981, outlining their compliance with present regulations and City ordinances and indicating their support for the proposed ordinance.

Councillor Wylie stated that this letter would be made part of the Committee records.

The Chair declared the proponents hearing closed when none appeared at the call of the Chair and requested the opponents to come forward.

No one appeared at the call of the Chairman who then declared the hearing closed.

Councillor Wylie then outlined the following matter for consideration by the City Council prior to action on the proposed amendment.

The following amendments are submitted for consideration by the City Council to the draft submitted by the Committee.

1. On page 2, Paragraph I, sub-paragraph C #4, insert after the word above, the words adopted by the National Institute of Health.

2. On page 3, in the first line of Paragraph V substitute for the words mandated by the Guidelines the following required by the National Institute of Health Guidelines.

3. On page 3, Paragraph X strike out word effectively in the first line.

4. On page 5, in the last line of Section 11-11 Penalties to substitute stronger language for the words to comply to the extent feasible.

5. To determine the legality of the penalty clause calling for a fine of $200.00 per day on page 5, Section 11-11, Penalties.

6. To consider adding a clause to the proposed ordinance which would prohibit any employee of the City to be involved in any center, facility or organization conducting DNA research in the City of Cambridge.

Councillor Vellucci inquired of Dr. Neer regarding the vacancy in the position of Health and Hospital Commissioner and the problem of enforcement of the proposed ordinance and the issuance of permits in his absence.

Daniel J. Hayes, Jr. stated that in his opinion that the positions of Hospital Commissioner and Health Commissioner should be separated; that the Deputy City Manager, Robert Healy was now performing this function.

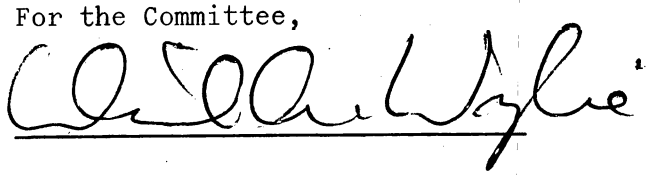
At 6:28 p.m. Mrs. Cornelia Wheeler recorded the DNA Experimentation Review Board in favor of the proposed ordinance.

At the request of Mayor Duehay, twenty members in the audience indicated their support for the ordinance amendment and none were recorded in opposition.

Councillor Vellucci moved that the proposed ordinance with all suggested changes be referred to the City Council meeting of March 30, 1981.

There being no objection the motion carried - and the committee adjourned at 6:35 p.m.

For the Committee,



Councillor David A. Wylie,
Chairman.

HARVARD UNIVERSITY

ROBIN SCHMIDT
Vice President

MASSACHUSETTS HALL
CAMBRIDGE, MASSACHUSETTS 02138
617-495-1703

March 23, 1981

Councillor David Wylie, Chairman
Committee on Ordinances
Cambridge City Council
Cambridge City Hall
Cambridge, Massachusetts

Re: "Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge"

Dear Councillor Wylie:

The proposed ordinance governing the use of recombinant DNA technology in Cambridge mandates the acquisition of a permit to conduct such research. This ordinance and the permit requirement have been reviewed by the Harvard Institutional Biosafety Committee and University officials. Should the ordinance be approved as written, we understand that application for a permit to continue recombinant DNA research activities will require written agreement that the following conditions will be met:

1) Work will be conducted in conformity with the NIH Guidelines, Administrative Practices Supplement and the NIH Large-Scale Physical Containment requirements.

2) Procedures will comply with the Cambridge City Ordinance.

3) Inspection of facilities and pertinent records will be allowed.

4) A health and safety manual will be used.

5) There will be a training program which covers safeguards and procedures for personnel using recombinant DNA molecules.

The requirements described above have for some time been a part of our operating procedures. Since passage of the Ordinance in February 1977, Harvard has required that all recombinant experiments be conducted in compliance with its provisions. Compliance with the NIH Guidelines and the Administrative Practices Supplement is mandated for all recombinant DNA research at the University by our receipt of funding from the National Institutes of Health. Should the University decide to permit the large-scale use of this technology, all work would be carried out in conformity with NIH requirements. Members of the Cambridge Biohazards

Committee have in the past and will in the future be encouraged to visit our laboratories. Information relevant to the conduct of their committee activities will continue to be made available to them. The University has on file with this committee two manuals which contain information relevant to the safe conduct of recombinant DNA research at the P1, P2 and P3 containment levels. These manuals also outline training requirements mandated by the Harvard Institutional Biosafety Committee.

Harvard University supports the ordinance as proposed. Should the ordinance be approved in its current form, the University will submit to the Commissioner of Health and Hospitals a formal application requesting a permit to conduct recombinant DNA research.

Sincerely,

Robin Schmidt

RS:mr

CITY OF CAMBRIDGE

CAMBRIDGE, MASSACHUSETTS 02139
Tel. 498-9011

EXECUTIVE DEPARTMENT
JAMES L. SULLIVAN
City Manager

HEALTH POLICY BOARD:

Dr. Melvin Chalfen, 31 Bates Street, Cambridge
Richard DeFilippi, 182 Upland Road, Cambridge
Oliver Farnum, 24 Callendar St., Cambridge
Judy Olson, 12 Inman Street, Cambridge
Peter Gil, 3 Wyman Street, Cambridge
Rev. Henry Horn, 338 Harvard Street, Cambridge
Dr. Robert Neer, 9 Redeisel Avenue, Cambridge
Zelia Pacheco-Kelleher, 392 Windsor Street, Cambridge
Manuel Rogers, 376 Cambridge St., Cambridge
Elsa Stern, 64 Oxford Street, Cambridge
Gloria Thompson, 82 Chilston Street, Cambridge
Penny Hollander Feldman, 34 High Street, Cambridge

BIOHAZARDS COMMITTEE:

Dr. Robert Neer
Elsa Stern
Oliver Farnum
Zelia Pacheco-Kelleher

DNA Experimentation Review Board:

John L. Brusch, M. D., 1493 Cambridge Street, Cambridge
Daniel J. Hayes, Jr., 60 Rindge Avenue, Cambridge
Mrs. Constance Hughes, 64 Gorham Street, Cambridge
Mrs.Mary Nicoloro, 15 Harding Street, Cambridge
Sheldon Krimsky, Ph.D., 60 Gorham Street, Cambridge
William J. LeMessurier, 1033 Mass. Avenue, Cambridge (Home- 94 Brattle Street
Mrs. Cornelia Wheeler, 123 Coolidge Hill, Cambridge
Kenneth Daly, 72 Sciarappa Street, Cambridge

Page 4 Top of page c)

" Have an annual etc " (9)

Replace with

c)1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retian a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved

3) The institution shall reimburse the City for the expense of this inspection and review.

August Feb 4 / Draft

Question "1972"

Question "new"

City of Cambridge

In the Year One Thousand, Nine Hundred

Eighty One

AN ORDINANCE

In amendment to an Ordinance formerly entitled: "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by adding at the end thereof a new Article II entitled: "ORDINANCE FOR THE USE OF RECOMBINANT DNA TECHNOLOGY IN THE CITY OF CAMBRIDGE" which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. Guidelines for the Regulation of Recombinant DNA use.

I. Definitions

In the context of this ordinance the following definitions are adopted:

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the NIH Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, or group of individuals or organization

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms ~~contained in~~ containing (3) Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

3) Administrative Practices Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

4) Such amendments to 1, 2, and 3 above as may be approved by the Cambridge Biohazards Committee.

II. Purpose

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. Cambridge Biohazards Committee

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board ~~on the matters specified in Section II-9~~. (4)

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

IV. Permit Requirement

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

Page 3 Section V (6)

" The Institutional Biosafety etc

2nd line " shall include one etc "

Add after shall --

" have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved ~~etc.~~ and

Page 3 Section IX

" All reports to etc "

Make

IX The institution shall report within 30 days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the " Guidelines " and any significant RDNA related accidents or illnesses.

4) Prepare a Health and Safety manual which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review, ~~as established in Section II-9 of this ordinance.~~ (5)

have at least one member who is a nondoctoral person from a Laboratory Technical staff ~~2nd~~

5) Establish a training program of safeguards and procedures for personnel using RDNA.

V. The Institutional Biosafety Committee (IBC) mandated by the "Guidelines" shall ~~include~~ (6) one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

Substitute

IX. ~~All reports to the NIH required under the "Guidelines" shall be simultaneously reported to the CBC.~~ (4)

X. The premises in which RDNA is used must be effectively free of rodent and insect infestation.

Section 11-8. Large Scale (8)

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. Special Permit

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Develop procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved by the CBC and the Commissioner of Health and Hospitals.

Insert new section 9)

c) Have an annual audit of the monitoring process conducted by a person, agency, or institution approved by the CBC. The audit shall be conducted at the expense of the institution.

d) Establish a Health-Safety Program for appropriate employees. Such a program to include safety training and periodic retraining and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for "large scale" ~~cultures~~ uses of RDNA requiring P2 and P3 physical containment.

Section 11-9. Cambridge Biohazards Committee (CBC)

I. Specific responsibilities of the CBC shall include:

a) Establishing criteria to aid in the implementation of this ordinance.

b) Approving all amendments to the "Guidelines" before implementation.

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and in conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures ~~described in~~ required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. Restrictions

RDNA use classified by the "Guidelines" as requiring ~~containment above~~ P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

Section 11-11. Penalties

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the written agreements and or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply to the extent feasible).

Section 11-12. Severability of Sections

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

Final Draft 2/24/81

PROCEDURES, POLICIES, AND CRITERIA

OF CAMBRIDGE BIOHAZARDS COMMITTEE

Communication with CBC should take place through the Office of the Commissioner of Health and Hospitals of the City of Cambridge. Written material submitted for use of the entire CBC should be submitted in 5 copies.

Each institution must designate one member of its IBC (the chairperson or specific designee) who will be responsible for all communication with CBC.

To protect proprietary information, CBC will model its procedures upon those of the NIH Guidelines (section VI), F1-F4 inclusive (Federal Register of 11/21/80).

Ordinance Section 11-7:

I(c)(4) CBC must approve amendments to the "Guidelines" before their implementation in the City of Cambridge. If the National Institutes of Health amends the "Guidelines", the CBC will subsequently consider adopting these amendments, if requested to do so by permit holders. In making such requests, the permit holder should summarize in writing all the amendments adopted by NIH but not yet adopted by CBC. If permit holders want the CBC to expedite its consideration of new NIH amendments, the permit holders should so inform the committee. In such instances, summaries of "proposed amendments" published in the Federal Register for public comment may be discussed with the CBC. Formal action by the CBC on amendments to the "Guidelines", however, will take place only after such amendments are formally adopted and officially promulgated by NIH.

IV(a) Applicants for permits to use RDNA should contact the Office of the Commissioner of Health and Hospitals, which will schedule a meeting of the applicant with the CBC, to discuss how the applicant plans to satisfy the requirements of the ordinance.

IV(a)(3) CBC will periodically visit the premises where RDNA is used in order to review pertinent facilities and records of permit holders.

IV(a)(4) Health and Safety Manual containing procedures relevant to the use of RDNA should be submitted to the CBC for review.

Section 11-7:

IV(a)(5) Training program of safeguards and procedures for personnel using RDNA, including the nature and frequency of re-training, should be discussed with CBC, and eventually described in writing. CBC approval of such programs is required under section 11-9 I(d) of the ordinance.

V City ordinance requires approval by the Health Policy Board of one representative on each Institutional Biosafety Committee. This individual must be a community representative, as described in section IV-D-2 of the current (11/21/80) NIH Guidelines. The CBC believes this individual must live in Cambridge.

VI Minutes of the Institutional Biosafety Committee meetings, which shall include the names of members present, the names of members absent, and the numerical results of all votes taken, will be reviewed by CBC.

Reports, applications, and recommendation of Institutional Biosafety Committees to the institution, when relevant to implementation of this ordinance, should be sent to CBC for review.

Annual reports of RDNA use by each permit holder, including the number of principal investigators/users, the number of P1, P2, and P3 projects, the number of P1-LS, P2-LS, and P3-LS projects, a brief description of each deliberate expression experiment, and the attendance record of each IBC member at IBC meetings, shall be submitted to CBC for review. CBC would welcome IBC's comments about the ordinance or the operations of CBC.

VIII CBC must approve the medical surveillance program for persons using RDNA, as developed by each institution. A written description of the program and any changes to it must be discussed with CBC. The program must include a permanent record of the name and social security number (or other identifier if social security number does not exist) for all individuals using RDNA.

Section 11-8:

I CBC must conduct, with the Commissioner of Health and Hospitals, a public hearing prior to the issuance of a special "large-scale" RDNA use permit. Such hearings will be arranged with the applicant for a large-scale permit at a mutually convenient date and location in Cambridge, after appropriate public notice through the Cambridge City Clerk's office.

I(b) For "large-scale" uses of RDNA, CBC and the Commissioner of Health and Hospitals must approve the monitoring procedures adopted by each institution to assure compliance with the ordinance and the "Guidelines". These should first be approved by the institution's Biosafety Committee, and then discussed with CBC.

I(c) The ordinance requires the CBC and the institution to agree upon the scope of an annual inspection and review of "large-scale" uses of RDNA, and requires CBC to retain the person, persons, agency, or institution that conducts this inspection and review. The inspector-reviewer will be retained by CBC through the Commissioner of Health and Hospitals, shall meet with CBC, and shall submit a written report to CBC, the Commissioner of Health and Hospitals, and the institution. Thereafter, the Commissioner will pay the inspector-reviewer, and bill the institution for this expense.

Section 11-8:

I(d) Institutional health-safety programs for individuals involved in "large-scale" uses of RDNA must be approved by CBC. The committee will require training programs for such individuals, which cover at a minimum the operation of pertinent "large-scale" equipment, and the procedures to be followed in case of accidents or spills with large volumes of RDNA. Retraining with regard to emergency procedures must occur at least annually. Such training and re-training programs are in addition to those required for individuals using RDNA on a smaller scale. Medical surveillance programs for "large-scale" users of RDNA should be submitted to CBC for approval.

I(e) "Large-scale" uses of RDNA requiring P2 or P3 physical containment must be approved in advance by CBC. For P2-LS approval, CBC will require the individuals working with large volumes of RDNA at P2 containment to have had prior experience with large-scale cultures and large volume operations, using the particular equipment that will be employed for the P2-LS work. For P3-LS approval, CBC will require the individuals working with large volumes of RDNA at P3 containment to have had prior experience with P2-LS cultures and operations, and prior P1-LS or P2-LS experience using the particular equipment that will be employed for the P3-LS work. Institutions seeking P3-LS approval should meet with CBC in advance to outline the reasons. Before considering applications for P2-LS or P3-LS use of RDNA, CBC will require an independent inspection to establish the institution's ability to satisfy the P2-LS or P3-LS requirements of the "Guidelines".

Section 11-9:

I(a),(b),(c), (d),(e) (covered above)

I(f) In the locations where RDNA is used, institutions shall post the name of the Cambridge Biohazards Committee, together with its address or telephone number (identical to that of the Commissioner of Health and Hospitals), or the name (with address or telephone number) of the CBC chairperson. Institutions shall give a copy of the Cambridge ordinance to all persons using RDNA,as part of their initial training program.

Section 11-10: If biological containment greater than HV-2 becomes feasible, and institutions then desire CBC approval for RDNA use requiring P3 physical containment greater than HV-2, they should meet with CBC to discuss the particular circumstances. In response to such requests, CBC may seek competent professional assistance from the National Institutes of Health or elsewhere.

and biological containment

CITY OF CAMBRIDGE

CAMBRIDGE, MASSACHUSETTS 02139
Tel. 876-6800

EXECUTIVE DEPARTMENT
JAMES L. SULLIVAN
City Manager

January 26, 1981

To the Honorable, the City Council:

I transmit herewith communication from Daniel J. Hayes, Jr., Chairman of the Cambridge Experimentation Review Board, enclosing a proposed revised Ordinance pertaining to the use of recombinant DNA technology in the City of Cambridge. This revised ordinance is the result of a joint effort of the CERB and the Cambridge Biohazards Committee.

Very truly yours,

Robert W. Healy
Acting City Manager

RWH/b

Agenda # 5

Proposed revised ordinance pertaining to the use of recombinant DNA technology in the City of Cambridge.

In City Council,

January 26, 1981

1/26/1981

Referred to the Committee on Health and Hospitals

copy sent to Common Wealth & Hospital 1/27/81 (dl)

Comm. on Ordinances 2/24/81

5:13 PM

Presiding Councilor Wylie

Present C. Vellucci 5:30 PM
E. D. Fulham 5:31 PM
Maggie Dooley 6:00 PM

Absent Hayes IV Chof the Joint Committee of the Comm & Design Board & Comm Bicentennial Committee met Jointly to design this ordinance

Introduced Mems
I Dr Bersch ✓ Mary Nicolos ✓
K Daley ✓ Connie Wheeler ✓
✓ Hayes

II Ordered Filed Steam - and ___ ✓
Members of
H Absent Biedermann MIT H
✓ Harvey

Absent of
Dean Vicenti
Too Advised -
Barbara Foster Read key of Committee

520 Dr

Reasons for revised ordinance - due to the large scale usage of Drugs

Brought to Jetton there who would not obey and there who would be in prison -

Federal rapid growth of Communal activity -

Regulations about trouble events that may happen -

Incorporate Guidelines for NFH

524 pm Invited -

CV Re Organization document into Government -

Unique Delineation of specific areas

Consider Com Advisory to NFH recommendations -

Phil Hoyle Grants a permit system - Difficult when you've had it - Prison Reform not concerned with permits

Kinds of permit in prison

Range of sentence - Anything over 10 yrs 5 years

Open Hearing 9 May 84

Boundaries are set for both Large and Small - by CUP -

Records and Production - a differential On Zone between R-1 H and Production Zone

Universities could have 10 in research -

345 Courses 16/11 Small laboratory ordinance structure

H

HTU Physical Ave

Proposed Amendments 550/09

1 © 4 after 11300c insert "Adopted by NFII"

2/ Add X Section Shall effectively from then

3/ Check out Penalty with City Solicitor Page 5 says $200.00 per day

4/ Page 5 11-11 Penalties Check (to the extent feasible.) While Below Shall should be strengthen

603 Dr Vern

While Congrats to Committee for job done

Dr Vern re procedure set up good value to supplement Note Guidelines Likely that many more ingredients to come & Could require permit procedure / in addition to Hood and not

6 of 07 The Post Corp has opened in the absence of Health Commissioner Talking specifics who is standing for the Commissioner trust in his absence — Question raised on probity of enforcement in absence of Health Commissioner

6 LV Jacoby to Oakdale

6:20/pm Ray Flynn — or Boston introduced

6:20/pm Motion for Record generally favoring the ordinance → Made part of the record —

9 Mayor Ruchey endorses Wallace critique

625 DNK Re Health Commissioner — When homeless voted for 4-4 BOH Welfare Dept - Would like to see the vote Book

→ 626 Dr Hyson 9/16 on Hospital to 91 Back to Hospital Dept and State Dep as Sponsor entities

628 Roma called for House in favor
to come Fwd
Whelan accorded Hse Committee
in favor
No one else appeared at the end
of the Hrng —
Mayor asked how Hands —
Appear to showed thru hands

No one appeared in opposition —
Non did hrg one dismiss by a
show of hands

630pm Miller wants all problem
areas completed and
sent to him

CC Compliance Coty. Comp Manual
Amended to be in Effy when Ords are
adopted or Renewed Lastly Chap 000
work

CV mvd

Refer ordinance to the full

Council with all amendments

—Leonard—

Adjourned at 6:35 pm

Learning and doing

Assertiveness training

The Cambridge Family and Children's Service is offering a six-week workshop on Assertiveness training for men and women starting March 24, and running through April 28. The class will meet Tuesday evenings from 7-8:30 at 99 Bishop Richard Allen Drive.

A sliding scale fee will be charged, and babysitting can be arranged. To register, or for more information, call 876-4210.

For working women

Radcliffe Career Services is sponsoring two one-day conferences designed for the working woman.

"Women as Managers" will cover many aspects of management, including leadership styles and learning how to analyze skills. The workshop will take place on Saturday, March 28, from 9:30 a.m.-4 p.m. The fee is $45. Registration deadline is March 23.

A second workshop on "Strategies for Advancement" will be presented on April 11, from 9 a.m.-5 p.m. The workshop is aimed at women who want to continue to work at their present organizations and explore ways of moving up. The fee for the workshop is $50, and registration deadline is April 6.

For further information on either workshop, or for an application, call 495-8631.

'Lifelong Learning'

The Center For Lifelong Learning of Harvard University, B-3 Lehman Hall, is offering three one-day workshops on Saturday, March 21.

"Fund-Raising: An Advanced Workshop," designed for fund-raisers who have had initial experience, gives detailed information on capital and annual fund campaigns. Meets from 9:30 a.m.-5:30 p.m. Tuition is $55.

"Developing Successful Direct Mail Programs" is for those in the business of direct marketing, and who have responsibility for mailings for educational, industrial, professional, or civic groups. Meets from 10 a.m.-4 p.m. Tuition is $45.

"Buying and Living in a Condominium" covers how to determine value of a condominium, and other issues such as financing, covenants, resale, and investment potential. Meets from 9:30 a.m.-4:30 p.m. Tuition is $50.

There is a $5 registration fee for all courses. Call 495-4973 for more information.

Courses with Lipman

The Music School, together with the Music Emporium, is offering several courses for teacher and parents, taught by Doug Lipman.

"Stories with Songs" will be offered on Sunday, March 22, from 3:30-5 p.m., where parents and teachers can learn fresh versions of tales, chants and songs. Cost is $3.

"Participation Stories" will be offered Saturday, March 28, from 9:30 a.m.-12:30 p.m. Cost is $17.

"Music Through the Day" deals with songs and rhymes to integrate with activities at home and school. To be held Saturday, May 2, 9:30 a.m.-12:30 p.m. Cost is $17.

"Songs About Feelings," offered Saturday, May 16, will deal with folk songs and rhymes used to foster verbalizations of moods, resentments, and other feelings. From 9:30 a.m.-12:30 p.m.

All events are held at the Music School, 2018 Massachusetts Ave., near Porter Square. Call 661-6977 for more information.

All Our Gifts

Do you feel your child is talented in some area? Would you like to help organize a group of parents interested in encouraging and assisting in the education of talented students in Cambridge? The objectives of such an organization would be to identify and coordinate the many community resources, both people and places; provide mentorship opportunities; and to develop an institute/seminar approach to inform the participants of the most current thinking and trends in the education of the talented students.

If you are interested, call Ted Wayne, Project Director of the All Our Gifts Program, Cambridge School Department, at 498-9240.

Offer favorite recipe

Recipes are being sought by the Cambridge Rindge and Latin School Dedication and Homecoming Committee to be published as part of the multi-cultural and heritage exhibit for the May 29 and 30 dedication of the new Cambridge High School. Please send your favorite recipe to CRLS dedication chairman Anthony Bruno, CRLS, 459 Broadway, Cambridge, 02138. Deadline for recipes is April 17.

Music school begins spring session

The Music School will open its spring session on Monday, March 30, offering instruction in traditional and contemporary styles of guitar, banjo, mandolin, fiddle, dulcimer, voice, harmonica, and other instruments.

Classes run from 4-10 weeks, and are taught at the Music School, 2018 Massachusetts Ave. near Porter Square.

For more information and a free brochure, call 661-6977.

SJC upholds permit law

Continued from page 1

state's election commission, said the SJC ruling supercedes the rent board's interpretation. His committee may consider amending the ordinance to exempt this class of owners.

Attorney William Walsh, representing the plaintiffs in the SJC case, said he will challenge the ruling but has not decided how. He said he will either ask for rehearing before the SJC, take the case to the United States Supreme Court, or file a separate suit in federal district court.

"I consider myself outraged," Walsh said. "Today it's so hard for any young person to own a home. You can understand protecting the elderly and protecting the poor, but there comes a point — and I think we've reached that point."

City special counsel Hans Loeser, a senior partner at Foley, Hoag and Eliot, called the decision "a flat out victory. It looks like this thing is over." He doubted that the Supreme Court would hear the case.

The rent board took its first two cases to court Friday when it filed complaints alleging violations at 36 Highland Ave. and 1572 Massachusetts Ave. The fact that the complaints were filed one day after the SJC ruling is coincidental, according to RCB Director Stanton. "But the decision certainly makes our job a little easier," he said.

At 36 Highland Ave., the complaint alleges, developer Emile Dupont illegally evaded the permit ordinance by selling units to long-term tenants who shortly thereafter resold them to new owners.

The board is asking the Middlesex County Superior Court for a preliminary injunction prohibiting Dupont from using this tactic. The board also wants the court, after a trial, to order condominium owners James P. Bouhana and Juliana Jensen to vacate their units and to assess fines against all defendants. A hearing is set for March 24.

At 1572 Massachusetts Ave. the board alleges that six condominium owners are living in their units without permits. The board, Stanton said, wants to assess fines and force the owners to move.

In both cases, the board seeks fines of $500 a day, Stanton said.

Walsh, who represents Dupont and one of the Massachusetts Avenue owners, said, "Both of these cases will bring this issue to a head.... It will be an interesting day in a variety of courts before this is over. The battle lines are really drawn on this one.... They want to have war on this and that's what we'll have. It's almost a nightmare; it's really a nightmare.

Lynn Weissberg, chairperson of the Alliance of Cambridge Tenants (ACT) legal committee, said her group has presented the rent board with evidence that about 60 owners illegally occupy apartments in four Cambridge buildings. ACT is gathering evidence about another building, she said.

"We've felt all along that the board was dragging its feet, we think, until the SJC decided this case," Weissberg said. "Now that the SJC has decided in so clear a decision, we think there's no excuse not to enforce the law."

The largest number of violations suspected by ACT are at 50 Follen St. near Harvard Square where tenant Gilbert Mason says 40 of 96 units are illegally occupied. Developer Douglas Yoffe said he has sold 40 condominiums in the building, but that about 30 of them are occupied by investors who rent them.

Weissberg and Stanton both feel the cases brought to the rent board represent only the tip of an iceberg.

"I have no estimate" on the total number of violations, Stanton said, "but I think it's considerable."

The SJC decision should increase the value of condominiums converted before August, 1979, or those put on the market as new construction, according to Cambridge Council of Realtors President Fred Meyer. "Those condominiums are now scarcer items," he said.

The case brought before the SJC was filed on Nov. 9, 1979. On Dec. 21, 1979, a Superior Court judge denied the plaintiffs' request for a preliminary injunction. Three weeks later the Cambridge Committee of Elders and eight tenants in apartments owned by individual plaintiffs intervened as defendants represented by Cambridge-Somerville Legal Services.

On May 13, 1980, a Superior Court judge ruled in favor of the defendants. The plaintiffs took their case to the Appeals Court, and defendants applied for a direct review by the SJC, a request which was granted last September.

SKATER — Kenny Pefine of 86 Gore St., a 1978 CRLS graduate, plays on the Suffolk University varsity hockey team. He is a sociology major.

Collecting names for unity award

The Civic Unity Committee, a city agency whose purpose is to provide racial harmony and intergroup understanding, is taking nominations for the "Clorae Everteze Award."

This award is given to an outstanding Cambridge resident whose dedication and service typifies that of the late Clorae Everetere, former Director of the Civic Unity Committee from 1970-1977.

Nominations should include the candidate's name, address, type of service, and reasons for nomination. All recommendations should be sent to the Civic Unity Committee, 795 Massachusetts Ave., Cambridge, Ma., 02139. Deadline for nominations is April 1.

Cantabulations

Andrea Stevens, daughter of Mr. and Mrs. Kenneth N. Stevens, 46 Foster St., has been named a College Scholar, the highest recognition for academic achievement, for the fall term at Middlebury College.

Christopher Barnes, photographer, who has been taking pictures of the Red Line construction for the past two years, shared slides of his work with members of the Cambridge Kiwanis at a recent luncheon meeting.

Conrad Randall Feininger, son of Mr. and Mrs. T. Lux Feininger, 22 Arlington St., will be appearing in Macalester College's production of of Henrik Ibsen's "Peer Gynt" on March 7, 13 and 14.

Cantabs

Mark McPhail of Cambridge has been named to the Dean's list at Emerson College. He is majoring in education.

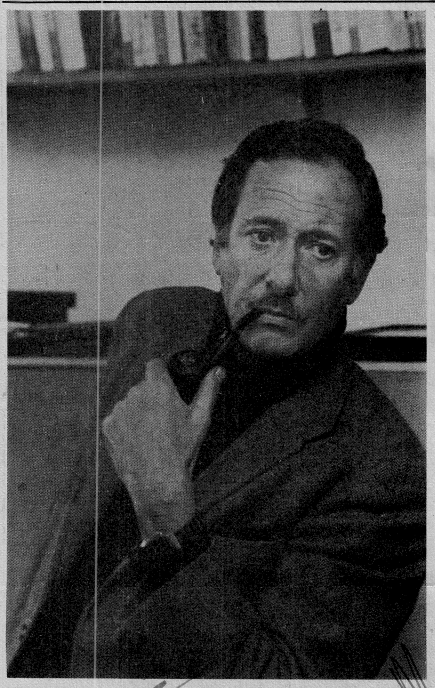
Gail Martin of Cambridge has been named to the Dean's list at Emerson College. She is majoring in visual design.

Alice Harrington and **Sylvia Grimes**, both of Cambridge, became health aides upon concluding their eight-week course held at Sancta Maria Hospital.

Michael S. Beaton, son of Mary Beaton of 6 Crawford St., made the dean's list for the fall quarter at Berklee School of Music.

Susan Ann O'Brien, daughter of Mr. and Mrs. George E. O'Brien of Cambridge, made the Dean's List of Trinity College in Washington, DC.

On the arts scene



ROBERT BRUSTEIN

ART's 'risky season' enters last lap

By Joan Axelrod
Special to the Chronicle

Up on the second floor of the American Repertory Theatre (ART), in an office marked "Development," the staffers are worried. Herbert Dane, ART's Director of Development, is anxiously awaiting the end of June, the date by which most subscription-renewal forms will have been returned to the office on Brattle Street.

Subscribers comprise about 75 per cent of ART's audience, and Dane and company are afraid that "Lulu" and "Has Washington Legs?" —the first, a clamorous remake of Frank Wedekind's turn-of-the-century tragicomedy, the second a satire without bite about movie moguls at work on a film about the American Revolution— may have alienated a sizable number of the company's 14,000 ticket holders.

"It's been a risky season," Dane admits with a sigh.

Taking risks is ART's trademark, according to Artistic Director Robert Brustein, the former Yale Drama School dean who came to Cambridge amid much fanfare last year. Not that the company believes in innovation for innovation's sake, he says, but it is proud of its reputation for boldness, impudence, and originality.

That "boldness," however, has been interpreted as pretentiousness" or "self-consciousness" by some theatergoers. Brustein blames such interpretations on "undeveloped" or "unprepared" viewing. Such criticisms will subside, he believes, if subscribers will just be patient or, to be more exact, if they will let ART "develop" their critical abilities.

A "developed" audience, according to the former theater critic, refuses to reject a play outright; instead, it allows itself to be "sparked" by the action on stage, thus sending a wave of "electricity" throughout the house.

"If an audience is prepared for an experience when it goes to the theater, there will be this kind of electrical tension," Bustein says with a sweep of the hand. "If the audience is simply prepared to have a few quiet, serene hours after dinner that tension disappears. Now I don't think we'll ever satisfy those spectators who come to the theater just to relax." He hesitates for a second. "No, let me take that back. We will satisfy them with certain productions, like 'Seven Deadly Sins,' 'Happy End,' and 'As You Like It.'"

Brustein's goal is to "develop an audience so that what it wants is what we want." But, according to subscribers interviewed by the Chronicle at various performances this season, Brustein has fallen short of his goal. ART's 1980-81 season (which is ⅔ over), they say, has been a disappointing combination of empty gimmickery, humorless comedy, and quicky opera. It was hardly a match to the glorious first season launched last March with the highly acclaimed "A Midsummer Night's Dream" and followed by "Terry by Terry," a brash new comedy by a young American playwright; "Happy End," a musical by Bertolt Brecht and Kurt Weill; and Gogol's "The Inspector General," as directed by "wonderkid" Peter Sellars.

After seeing ART's first four performances last year, an astounding 70% of the company's 13,000 ticket holders decided to renew their subscriptions. "I couldn't wait," recalls one subscriber. "I thought I'd be seeing six more great plays, like the ones I saw the first season. Boy was I in for a rude awakening."

The rude awakening began last fall when, after failing to receive copyright permission for Samuel Beckett's "Not I Come and Go," ART decided to stage Brecht and Weill's "The Berlin Requiem," which radiated about as much dramatic energy as a class of kindergartners singing "America the Beautiful." Fortunately, the entree, Brecht and Weill's "Seven Deadly Sins," was spicier, though not more substantial, than its appetizer. Some viewers left the colorfully staged and choreographed show enchanted. Others, when interviewed on their way out of the theater, said they felt cheated, agreeing with Boston Globe drama critic Kevin Kelly that ART's double feature was "perhaps the thinnest ticket in town."

While the "thin ticket" show left some subscribers grumbling, "Lulu," ART's next production, sent several subscribers into a rage. On opening night, close to half the ticket holders walked out at intermission. Brustein received so many scathing comments on ART's punk version of the Wedekind classic that he decided to devote the winter issue of "ART News," the company's newsletter, to the 'Lulu' Controversy."

In his opening statement, Brustein pleaded for patience, reminding subscribers that such great artists as Ibsen, Joyce, Picasso, and Stravinsky were not appreciated at first by their audiences. A few subscribers interviewed by the Chronicle were enraged by Brustein's statement, calling it "arrogant" and "self-serving."

By mid-January, the "Lulu" controversy had quieted down, and Brustein was confident that ART's next play, "Has Washington Legs?," would be a big success. He was wrong. Charles Wood's rambling and tedious satire about the American Revolution as showbiz was panned by critics and audiences alike.

"To tell you the truth, the reaction to that play surprised me," Brustein says. "I loved the play when I read it. I laughed out loud, which I rarely do in reading plays, and chose it especially for this community. I'm still trying to figure out the negative reaction to it. We've never done a play anywhere that has been so universally damned as that one."

The universal damnation came at a bad time. ART's finances are in precarious shape, and a string of bad reviews could throw the theater even further into the black. Last year, the company ended its season with a deficit of $12,373 and, unless important contributions start rolling in, the theater will slide further into debt.

Although ART has received substantial grants from the National Endowment for the Arts, the Massachusetts Council on Arts and Humanities, and the American Express Corporation, Brustein and Dane are feverishly trying to solicit community support, from individual as well as corporate sources. The company, says a spokesperson, does not know how federal and state belt tightening will affect ART's bank account.

The community, by and large, has not been quick to jump on ART's bandwagon, and Brustein admits it may take a while before Cambridge is willing to shoulder responsibility for the company's fiscal stability. Although it takes time for any resident repertory company to build up community support, ART, according to Brustein, has been having an especially hard time in Cambridge for two reasons: the community's "tradition-bound conservatism" and its "second city" feeling of inferiority to New York.

"So we think we have a job ahead of us in making the importance of this institution clear to the community," he says. "Harvard doesn't support it. It's a community operation, and we hope the community will see some obligation in helping it survive."

But Brustein & Company are savvy enough to recognize that community support will not come marked "no strings attached." Perhaps for that reason, the 1981-82 season is scheduled to include works by Moliere, Handel, Ibsen, Chekhov, and Shakespeare - less risky authors than, say, a Michael Feingold ("Lulu") or a Charles Wood ("Has Washington Legs?").

The 1981-82 schedule appears to be an attempt to tread a delicate middle ground. Says Development Director Herbert Dane: "We didn't put together the new schedule as an apology. But, yes, we recognize that this past season we have tried to move ahead too fast."

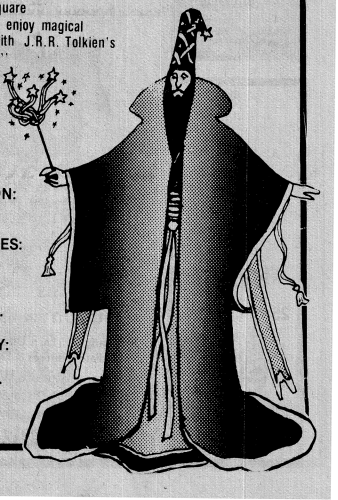
Locals perform Handel

Eleven Cambridge residents will sing in the single performance of George Frideric Handel's English opera, "Semele," at Jordan Hall March 28 at 8 p.m.

Highly controversial in its own time, "Semele" is the mythical story of a young mortal in love with the god Jupiter.

The Cecilia Society is performing the concert. The following society members are residents of Cambridge: Marlyene Altierei of Wendell Street, Robert Coren of Sycamore Street, Keith Glavash of Wendell Street, Steve Gould of Crescent Street, Deborah Greenman of Channing Street, Elizabeth Johnson of Copley Street, James McConaughy of Putnam Avenue, Wendy Silverberg of Lee Street, Diane Sokol of Kirkland street, Janet Taylor of Forest Street and Karen Vengerow of Huron Avenue.

Tickets are available for $7.50, $6.50 and $4.00 at the Jordan Hall box office, Bostix near Faneuil Hall or by calling 232-4540.



CAMBRIDGE EXPERIMENTATION REVIEW BOARD

January 22, 1981

Mr. James L. Sullivan
City Manager
City Hall
Cambridge, Massachusetts 02139

Dear Mr. Sullivan:

Enclosed herewith please find the proposed revised Ordinance relative to the use of recombinant DNA technology in the City of Cambridge. This is a joint effort of the Cambridge Biohazards Committee and the Experimentation Review Board.

We are now in the process of developing the criteria as proposed in the revised ordinance. This criteria will be available in time for the public hearings which will be scheduled by the Ordinance Committee.

Very truly yours,

Daniel J. Hayes, Jr.
Chairman

DJH/b

CITY OF CAMBRIDGE

CITY HALL, CAMBRIDGE, MASSACHUSETTS 02139 • (617) 498-9020

LAW DEPARTMENT

RUSSELL B. HIGLEY
CITY SOLICITOR

MICHAEL C. COSTELLO
ASSISTANT CITY SOLICITOR

EDWARD A. CUNNINGHAM
ANDREW T. TRODDEN
SEVERLIN B. SINGLETON
DAVID B. O'CONNOR
LEGAL COUNSEL

CHARLES A. WATSON
LEGISLATIVE AGENT

May 1, 1981

Paul E. Healy
City Clerk
City Hall
Cambridge, MA

Re: DNA Ordinance

Dear Mr. Healy:

Please be advised that I have reviewed the final draft of the DNA Ordinance and I approve of this ordinance in its present form.

Very truly yours,

Russell B. Higley

Russell B. Higley
City Solicitor

RBH:ln

C. C. 106

-DNA Ordinance-

City of Cambridge

MASSACHUSETTS

In City Council April 27 1981

Passed to be Ordained
-As amended-

MOTION OF Councillor Walter Sullivan

	YEA	NAY	ABSENT	PRESENT
Mr. Kevin P. Crane	✓			
Mr. Thomas W. Danehy	✓			
Ms. Saundra Graham	✓			
Mr. Leonard J. Russell	✓			
Mr. David E. Sullivan	✓			
Mr. Walter J. Sullivan	✓			
Mr. Alfred Vellucci		✓		
Mr. David A. Wylie	✓			
Mayor Francis H. Duehay	✓			
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CKJR
RF
A

Work Sheet - April 27, 1981 -

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

AN ORDINANCE

In amendment to an Ordinance formerly entitled "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by striking out the present Article II and substituting in place thereof a new Article II entitled "ORDINANCE FOR THE USE OF RECOMBINANT DNA TECHNOLOGY IN THE CITY OF CAMBRIDGE" which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. Guidelines for the Regulation of Recombinant DNA use.

I. Definitions

In the context of this ordinance the following definitions are adopted:

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the ~~NIH~~ National Institute of Health Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

1 Ok Amended

b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

3) Administrative Practices Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

4) Such amendments to 1, 2, and 3 above as may be approved by the Cambridge Biohazards Committee.

II. Purpose

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. Cambridge Biohazards Committee

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

IV. Permit Requirement

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manual which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

V. The Institutional Biosafety Committee (IBC) mandated by the "Guidelines" shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

X. The premises in which RDNA is used must be effectively free of rodent and insect infestation.

Section 11-8. Large Scale

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. Special Permit

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved the the CBC

and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

(7)

3) The institution shall reimburse the City for the expense of this inspection and review. INCLUDING AN APPORTIONMENT OF THE SALARIES OF THE STAFF OF THE CBC UNDER SECTION 11-7 III SUB SECTIONS B AND C

Amendment #7 by CD Full Vote

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic re-training and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. Cambridge Biohazards Committee (CBC)

I. Specific responsibilities of the CBC shall include:

(8)

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

b) Approving all amendments to the "Guidelines" before their implementation in Cambridge. IN THE EVENT THAT THE NATIONAL INSTITUTES OF HEALTH SHALL DISCONTINUE OR ABOLISH THEIR GUIDELINES, THOSE GUIDELINES IN EFFECT AT THE TIME OF THEIR DISCONTINUANCE SHALL REMAIN IN EFFECT IN THE CITY OF CAMBRIDGE

CV Amendment VIII

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

(9)

Section 11-10. Restrictions

I RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

II Insert New Amendment here Amendment VIII

Section 11-11. Penalties

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply [to the extent feasible]] with the CBC

(10)

#9/10 Amendment adopted Provisions of this ordinance

Section 11-12. Severability of Sections

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

V Section 11-13 City Employees - not moved Not Added - Not Amended

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

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ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

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b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

3) Administrative Practices Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

4) Such amendments to 1, 2, and 3 above as may be approved by the Cambridge Biohazards Committee.

II. Purpose

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. Cambridge Biohazards Committee

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

IV. Permit Requirement

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee..

4) Prepare a Health and Safety manual which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

V. The Institutional Biosafety Committee (IBC) mandated by the "Guidelines" shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

X. The premises in which RDNA is used must be effectively free of rodent and insect infestation.

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a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved the the CBC

and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

3) The institution shall reimburse the City for the expense of this inspection and review.

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic re-training and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. Cambridge Biohazards Committee (CBC)

I. Specific responsibilities of the CBC shall include:

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

b) Approving all amendments to the "Guidelines" before their implementation in Cambridge.

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. Restrictions

RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

Section 11-11. Penalties

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply to the extent feasible).

Section 11-12. Severability of Sections

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

CAMBRIDGE CITY COUNCIL

CITY HALL, CAMBRIDGE, MASSACHUSETTS 02139

(617) 876-6800

David A. Wylie
City Councillor

MEMORANDUM

TO: Cambridge City Council
FROM: David Wylie, Chairman, Ordinance Committee
DATE: April 13, 1981

PROPOSED AMENDMENTS TO
PROPOSED DNA ORDINANCE

There follows the amendments which were discussed at the Ordinance Committee hearing held March 24, 1981:

1. Spell out National Institute of Health and insert wherever "NIH" appears.

2. Page 2 - Section I c) 4) - insert after the word "above" the words "which impose stricter or more restrictive requirements"

3. Page 3 - Section X - strike the word "effectively"

4. Page 5 - Section 11-11 II - delete the words "to the extent feasible"

5. Page 5, End - add the following additional section:

Section 11-13. City Employees.

a) Other than as required in the course of their city employment, no employee of the City of Cambridge may become involved, directly or indirectly, by ownership, contract, compensation, voluntary service or otherwise, in any institution, company, business or facility which is subject to this Ordinance with respect to the subject matter of the Ordinance.

b) At any time when the position of Commissioner of Health and Hospitals is not filled the duties and responsibilities of such person contained in this Ordinance shall be performed by the acting Commissioner of Health and Hospitals.

City of Cambridge

In City Council March 30, 1981

The Ordinance *Committee*

comprised of the entire membership of the City Council
to which was referred a proposed amendment to Chapter Eleven, Article II, Section 11-7 through 11-9 of the General Ordinances of the City of Cambridge, entitled Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge met on Tuesday, March 24, 1981 at 5:13 p.m. in the City Council Chamber.

Councillor David A. Wylie, Chairman of the committee presided.

The Chairman called for the proponents to come forward to be heard.

The Committee heard from Daniel J. Hayes, Jr., Chairman of the Cambridge Experimentation Review Board which had held joint meetings with the Cambridge Biohazards Committee to draft changes to the present DNA ordinance.

Mr. Hayes introduced the DNA Experimentation Review Board Committee members who were present in the Chamber: Dr. John L. Brusch, Kenneth Daly, Mrs. Constance Hughes, Mrs. Mary Nicoloro, Mrs. Constance Wheeler and Dr. Robert Neer; Elsa Stern and Oliver Farnum of the Biohazards Committee and the Health Policy Board.

The Committee heard from Dr. Robert Neer who outlined the proposed amendment and stressed the need for a revised ordinance due to the large scale DNA usage and proposed commercial applications. He stated that the joint committee sessions brought together those who would set policy and those who would be engaged in the processing; that the regulations were directed towards events that could happen; that NIH guidelines were incorporated by reference to regulate the commercial activity which was anticipated.

In answer to questions by Councillor Vellucci he stated that the City Council could add regulations to those prepared by the NIH.

Daniel J. Hayes stated that the revision would provide for a permit system; that the present ordinance did not contain provisions for permits; that two kinds of permits were contemplated by the amendment for both small and large scale operations in accordance with guidelines set by NIH.

The Committee heard from Sheldon Krimsky of the CERB who also serves as a member of NIH Recombinant DNA Advisory Committee who stated that the potential risks of DNA technology were far less today than they were five years ago and stressed the need to establish the regulations to control the commercial applications which requires large amounts of recombinant DNA as distinguished from the Harvard and MIT Laboratories which use small amounts in their research.

Dr. Neer stated that the proposed ordinance would enable the City to keep in touch with the increased increase in experimentation and would require institutions doing large scale work to reimburse the City for inspections, to train workers and prepare a safety manual, provide medical surveilliance of personnel and advance approval for all large scale work at the higher P2 and P3 containment levels.

The Committee received a letter from Robin Schmidt, Vice-President of Harvard University dated March 23, 1981, outlining their compliance with present regulations and City ordinances and indicating their support for the proposed ordinance.

Councillor Wylie stated that this letter would be made part of the Committee records.

The Chair declared the proponents hearing closed when none appeared at the call of the Chair and requested the opponents to come forward.

No one appeared at the call of the Chairman who then declared the hearing closed.

Councillor Wylie then outlined the following matter for consideration by the City Council prior to action on the proposed amendment.

The following amendments are submitted for consideration by the City Council to the draft submitted by the Committee.

1. On page 2, Paragraph I, sub-paragraph C #4, insert after the word above, the words adopted by the National Institute of Health.

2. On page 3, in the first line of Paragraph V substitute for the words mandated by the Guidelines the following required by the National Institute of Health Guidelines.

3. On page 3, Paragraph X strike out word effectively in the first line.

4. On page 5, in the last line of Section 11-11 Penalties to substitute stronger language for the words to comply to the extent feasible.

5. To determine the legality of the penalty clause calling for a fine of $200.00 per day on page 5, Section 11-11, Penalties.

6. To consider adding a clause to the proposed ordinance which would prohibit any employee of the City to be involved in any center, facility or organization conducting DNA research in the City of Cambridge.

Councillor Vellucci inquired of Dr. Neer regarding the vacancy in the position of Health and Hospital Commissioner and the problem of enforcement of the proposed ordinance and the issuance of permits in his absence.

Daniel J. Hayes, Jr. stated that in his opinion that the positions of Hospital Commissioner and Health Commissioner should be separated; that the Deputy City Manager, Robert Healy was now performing this function.

At 6:28 p.m. Mrs. Cornelia Wheeler recorded the DNA Experimentation Review Board in favor of the proposed ordinance.

At the request of Mayor Duehay, twenty members in the audience indicated their support for the ordinance amendment and none were recorded in opposition.

Councillor Vellucci moved that the proposed ordinance with all suggested changes be referred to the City Council meeting of March 30, 1981.

There being no objection the motion carried - and the committee adjourned at 6:35 p.m.

For the Committee,

_____

Councillor David A. Wylie,
Chairman.

HARVARD UNIVERSITY

ROBIN SCHMIDT
Vice President

MASSACHUSETTS HALL
CAMBRIDGE, MASSACHUSETTS 02138
617-495-1703

March 23, 1981

Councillor David Wylie, Chairman
Committee on Ordinances
Cambridge City Council
Cambridge City Hall
Cambridge, Massachusetts

Re: "Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge"

Dear Councillor Wylie;

The proposed ordinance governing the use of recombinant DNA technology in Cambridge mandates the acquisition of a permit to conduct such research. This ordinance and the permit requirement have been reviewed by the Harvard Institutional Biosafety Committee and University officials. Should the ordinance be approved as written, we understand that application for a permit to continue recombinant DNA research activities will require written agreement that the following conditions will be met:

1) Work will be conducted in conformity with the NIH Guidelines, Administrative Practices Supplement and the NIH Large-Scale Physical Containment requirements.

2) Procedures will comply with the Cambridge City Ordinance.

3) Inspection of facilities and pertinent records will be allowed.

4) A health and safety manual will be used.

5) There will be a training program which covers safeguards and procedures for personnel using recombinant DNA molecules.

The requirements described above have for some time been a part of our operating procedures. Since passage of the Ordinance in February 1977, Harvard has required that all recombinant experiments be conducted in compliance with its provisions. Compliance with the NIH Guidelines and the Administrative Practices Supplement is mandated for all recombinant DNA research at the University by our receipt of funding from the National Institutes of Health. Should the University decide to permit the large-scale use of this technology, all work would be carried out in conformity with NIH requirements. Members of the Cambridge Biohazards

Committee have in the past and will in the future be encouraged to visit our laboratories. Information relevant to the conduct of their committee activities will continue to be made available to them. The University has on file with this committee two manuals which contain information relevant to the safe conduct of recombinant DNA research at the P1, P2 and P3 containment levels. These manuals also outline training requirements mandated by the Harvard Institutional Biosafety Committee.

Harvard University supports the ordinance as proposed. Should the ordinance be approved in its current form, the University will submit to the Commissioner of Health and Hospitals a formal application requesting a permit to conduct recombinant DNA research.

Sincerely,

Robin Schmidt

RS:mr

City of Cambridge

In City Council March 30, 1981

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Councillor David A. Wylie,
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ROBIN SCHMIDT
Vice President

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March 23, 1981

Councillor David Wylie, Chairman
Committee on Ordinances
Cambridge City Council
Cambridge City Hall
Cambridge, Massachusetts

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Sincerely,

Robin Schmidt

RS:mr

C. C. 106

807 PM C. Vellucci Amendment

City of Cambridge

MASSACHUSETTS

In City Council April 27 198/

	YEA	NAY	ABSENT	PRESENT
Mr. Kevin P. Crane	✓			
Mr. Thomas W. Danehy	✓			
Ms. Saundra Graham	✓			
Mr. Leonard J. Russell	✓			
Mr. David E. Sullivan	✓			
Mr. Walter J. Sullivan	✓			
Mr. Alfred Vellucci		✓		
Mr. David A. Wylie	✓			
Mayor Francis H. Duehay	✓			
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Ord 1K
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Passed to be Ordained
as amended

City of Cambridge

In the Year One Thousand, Nine Hundred

Eighty One

AN ORDINANCE

In amendment to an Ordinance formerly entitled: "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by adding at the end thereof a new Article II entitled: "ORDINANCE FOR THE USE OF RECOMBINANT DNA TECHNOLOGY IN THE CITY OF CAMBRIDGE" which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. Guidelines for the Regulation of Recombinant DNA use.

I. Definitions

In the context of this ordinance the following definitions are adopted:

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the NIH Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, ~~or~~ group of individuals / OR ORGANIZATION

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms contained in Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

3) Administrative Practices Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

4) Such amendments to 1, 2, and 3 above as may be approved by the Cambridge Biohazards Committee.

II. Purpose

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. Cambridge Biohazards Committee

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board on the matters specified in Section 11-9.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

IV. Permit Requirement

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manual which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review as established in Section II-9 of this ordinance.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

V. The Institutional Biosafety Committee (IBC) mandated by the "Guidelines" shall include one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. All reports to the NIH required under the "Guidelines" shall be simultaneously reported to the CBC.

X. The premises in which RDNA is used must be effectively free of rodent and insect infestation.

Section 11-8. Large Scale

All institutions using RDNA on a large scale as defined in the "Guidelines" must adhere to the following requirements in addition to those stated in Section 11-7.

I. Special Permit

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Develop procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved by the CBC and the Commissioner of Health and Hospitals.

c) Have an annual audit of the monitoring process conducted by a person, agency, or institution approved by the CBC. The audit shall be conducted at the expense of the institution.

d) Establish a Health-Safety Program for appropriate employees. Such a program to include safety training and periodic retraining, periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for large-scale cultures requiring P2 and P3 physical containment.

Section 11-9. Cambridge Biohazards Committee (CBC)

I. Specific responsibilities of the CBC shall include:

a) Establishing criteria to aid in the implementation of this ordinance.

b) Approving all amendments to the "Guidelines" before implementation.

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and in conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures described in Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. Restrictions

RDNA use classified by the "Guidelines" as requiring containment above P3 physical containment and biological containment greater than HV-2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

Section 11-11. Penalties

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

III. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City ordinance, the written agreement, and the NIH Guidelines (not withstanding reasonable notice and an opportunity to correct such failures to comply to the extent feasible).

Section 11-12. Severability of Sections

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

Original & Final

Draft

Do not issue - Keep with Papers

ORDINANCE NO. 955

Final Publication No. 2092. First publication in the Chronicle on April 2, 1981.

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

AN ORDINANCE

In amendment to an Ordinance formerly entitled "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by striking out the present Article II and substituting in place thereof a new Article II entitled Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. GUIDELINES FOR THE REGULATION OF RECOMBINANT DNA USE

I. DEFINITIONS

In the context of this ordinance the following definitions are adopted:

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the National Institutes of Health Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

3) Administrative Practices Supplement to the National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

4) Such amendments to 1, 2, and 3 above adopted by the National Institutes of Health as may be approved by the Cambridge Biohazards Committee. In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of such discontinuance shall remain in effect in the City of Cambridge.

II. PURPOSE

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. CAMBRIDGE BIOHAZARDS COMMITTEE.

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

d) The salaries and expenses of the staff and consultants of the CBC under this ordinance shall be apportioned to the institutions holding permits under this ordinance.

IV. PERMIT REQUIREMENT.

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manuel which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

V. The Institutional Biosafety Committee (IBC) required by the National Institutes of Health Guidelines shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

X. The premises in which RDNA is used must be totally and completely free of rodent and insect infestation.

Section 11-8. LARGE SCALE

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. SPECIAL PERMIT.

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved by the CBC and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

3) The institution shall reimburse the City for the expense of this inspection and review including an apportionment of the salaries of the staff of the CBC under Section 11-7, III subsections (b) and (c).

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic retraining and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. CAMBRIDGE BIOHAZARDS COMMITTEE (CBC).

I. Specific responsibilities of the CBC shall include:

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

b) Approving all amendment to the "Guidelines" before their implementation in Cambridge. In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of such discontinuance shall remain in effect in the City of Cambridge.

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. RESTRICTIONS.

I. RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

II. There shall be no deliberate release into the environment, that is, the sewers, drains or the air, of any organism containing recombinant DNA and further that any accidental release shall be reported to the Commissioner of Health and Hospitals within five days.

Section 11-11. PENALTIES.

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply with the provisions of this ordinance).

Section 11-12. SEVERABILITY OF SECTIONS.

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independednt provision, and such holding shall not affect the validity of the remaining portions thereof.

In City Council April 27, 1981.

Passed to be ordained as amended by a yea and nay vote: Yeas 8; Nays 1; Absent 0.

James L. Sullivan, City Manager.

ATTEST:- Paul E. Healy, City Clerk.

ORDINANCE NO. 955

Final Publication No. 2092. First publication in the Chronicle on April 2, 1981.

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

AN ORDINANCE

In amendment to an Ordinance formerly entitled "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by striking out the present Article II and substituting in place thereof a new Article II entitled Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. GUIDELINES FOR THE REGULATION OF RECOMBINANT DNA USE

I. DEFINITIONS

In the context of this ordinance the following definitions are adopted:

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the National Institutes of Health Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

3) Administrative Practices Supplement to the National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

4) Such amendments to 1, 2, and 3 above adopted by the National Institutes of Health as may be approved by the Cambridge Biohazards Committee. In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of such discontinuance shall remain in effect in the City of Cambridge.

II. PURPOSE

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. CAMBRIDGE BIOHAZARDS COMMITTEE.

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

d) The salaries and expenses of the staff and consultants of the CBC under this ordinance shall be apportioned to the institutions holding permits under this ordinance.

IV. PERMIT REQUIREMENT.

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manuel which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

V. The Institutional Biosafety Committee (IBC) required by the National Institutes of Health Guidelines shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

X. The premises in which RDNA is used must be totally and completely free of rodent and insect infestation.

Section 11-8. LARGE SCALE

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. SPECIAL PERMIT.

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved by the CBC and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

3) The institution shall reimburse the City for the expense of this inspection and review including an apportionment of the salaries of the staff of the CBC under Section 11-7, III subsections (b) and (c).

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic retraining and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. CAMBRIDGE BIOHAZARDS COMMITTEE (CBC).

I. Specific responsibilities of the CBC shall include:

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

b) Approving all amendment to the "Guidelines" before their implementation in Cambridge. In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of such discontinuance shall remain in effect in the City of Cambridge.

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. RESTRICTIONS.

I. RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

II. There shall be no deliberate release into the environment, that is, the sewers, drains or the air, of any organism containing recombinant DNA and further that any accidental release shall be reported to the Commissioner of Health and Hospitals within five days.

Section 11-11. PENALTIES.

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply with the provisions of this ordinance).

Section 11-12. SEVERABILITY OF SECTIONS.

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independednt provision, and such holding shall not affect the validity of the remaining portions thereof.

In City Council April 27, 1981.

Passed to be ordained as amended by a yea and nay vote: Yeas 8; Nays 1; Absent 0.

James L. Sullivan, City Manager.

ATTEST:- Paul E. Healy, City Clerk.

ORDINANCE NO. 955

Final Publication No. 2092. First publication in the Chronicle on April 2, 1981.

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

AN ORDINANCE

In amendment to an Ordinance formerly entitled "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by striking out the present Article II and substituting in place thereof a new Article II entitled Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. GUIDELINES FOR THE REGULATION OF RECOMBINANT DNA USE

I. DEFINITIONS

In the context of this ordinance the following definitions are adopted:

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the National Institutes of Health Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

3) Administrative Practices Supplement to the National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

4) Such amendments to 1, 2, and 3 above adopted by the National Institutes of Health as may be approved by the Cambridge Biohazards Committee. In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of such discontinuance shall remain in effect in the City of Cambridge.

II. PURPOSE

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. CAMBRIDGE BIOHAZARDS COMMITTEE.

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

d) The salaries and expenses of the staff and consultants of the CBC under this ordinance shall be apportioned to the institutions holding permits under this ordinance.

IV. PERMIT REQUIREMENT.

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manuel which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

V. The Institutional Biosafety Committee (IBC) required by the National Institutes of Health Guidelines shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

X. The premises in which RDNA is used must be totally and completely free of rodent and insect infestation.

Section 11-8. LARGE SCALE

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. SPECIAL PERMIT.

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved by the CBC and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

3) The institution shall reimburse the City for the expense of this inspection and review including an apportionment of the salaries of the staff of the CBC under Section 11-7, III subsections (b) and (c).

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic retraining and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. CAMBRIDGE BIOHAZARDS COMMITTEE (CBC).

I. Specific responsibilities of the CBC shall include:

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

b) Approving all amendment to the "Guidelines" before their implementation in Cambridge. In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of such discontinuance shall remain in effect in the City of Cambridge.

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. RESTRICTIONS.

I. RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

II. There shall be no deliberate release into the environment, that is, the sewers, drains or the air, of any organism containing recombinant DNA and further that any accidental release shall be reported to the Commissioner of Health and Hospitals within five days.

Section 11-11. PENALTIES.

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply with the provisions of this ordinance).

Section 11-12. SEVERABILITY OF SECTIONS.

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independednt provision, and such holding shall not affect the validity of the remaining portions thereof.

In City Council April 27, 1981.

Passed to be ordained as amended by a yea and nay vote: Yeas 8; Nays 1; Absent 0.

James L. Sullivan, City Manager.

ATTEST:- Paul E. Healy, City Clerk.

- Final Work Sheet

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

AN ORDINANCE

In amendment to an Ordinance formerly entitled "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by striking out the present Article II and substituting in place thereof a new Article II entitled "ORDINANCE FOR THE USE OF RECOMBINANT DNA TECHNOLOGY IN THE CITY OF CAMBRIDGE" which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. Guidelines for the Regulation of Recombinant DNA use.

I. Definitions

In the context of this ordinance the following definitions are adopted:

Amendment #1

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the ~~NIH~~ National Institutes of Health Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

Amendment #2 — National Institutes of Health

3) Administrative Practices Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

Amendment #3 — Adopted by the National Institutes of Health

4) Such amendments to 1, 2, and 3 above as may be approved by the Cambridge Biohazards Committee.

Amendment #4 — In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of their discontinuance, shall remain in effect in the City of Cambridge

II. Purpose

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. Cambridge Biohazards Committee

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

Amendment #11 — Add Amendment #11 Here — That the salaries and expenses of the staff and consultants of the CBC under this ordinance shall be apportioned to the

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

Add Amendment #11 Here

d) Institutions holding permits under this ordinance

IV. Permit Requirement

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manual which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

Amendment #5 Required by the National Institutes of Health guidelines

V. The Institutional Biosafety Committee (IBC) ~~mandated by the~~ "~~Guidelines~~" shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

Amendment #6 totally and completely

X. The premises in which RDNA is used must be ~~effectively~~ free of rodent and insect infestation.

Section 11-8. Large Scale

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. Special Permit

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved the the CBC

and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

Amendment #7 3) The institution shall reimburse the City for the expense of this inspection and review INCLUDING AN APPORTIONMENT OF THE SALARIES OF THE STAFF OF THE CBC UNDER SECTION 11-7, III SUBSECTIONS B) AND C)

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic re-training and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. Cambridge Biohazards Committee (CBC)

I. Specific responsibilities of the CBC shall include:

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

b) Approving all amendments to the "Guidelines" before their implementation in Cambridge. IN THE EVENT THAT THE NATIONAL INSTITUTES OF HEALTH SHALL DISCONTINUE OR ABOLISH THEIR GUIDELINES, THOSE GUIDELINES IN EFFECT AT THE TIME OF THEIR DISCONTINUANCE SHALL REMAIN IN EFFECT IN THE CITY OF CAMBRIDGE

Amendment #8 such

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

Check this against procedure #4

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. Restrictions

Amendment #9

I. RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

II. There shall be no deliberate Release into the environment, that is, the sewers, drains or the air, of any organism containing Recombinant DNA and further that any accidental release shall be reported to the Commissioner of Health and Hospitals within five days

Section 11-11. Penalties

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply ~~to the extent feasible~~). with the provisions of this ordinance

Amendment #10

Section 11-12. Severability of Sections

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

Note Environment - Definition - including but not limited to sewers drains air atmospheric

- Final Work Sheet

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

AN ORDINANCE

In amendment to an Ordinance formerly entitled "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

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ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. Guidelines for the Regulation of Recombinant DNA use.

I. Definitions

In the context of this ordinance the following definitions are adopted:

Amendment #1

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the National Institutes of Health Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

Amendment #2 — National Institutes of Health

3) Administrative Practices Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

Amendment #3 — Adopted by the National Institutes of Health

4) Such amendments to 1, 2, and 3 above as may be approved by the Cambridge Biohazards Committee.

Amendment #4 — In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of such discontinuance, shall remain in effect in the City of Cambridge

II. Purpose

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. Cambridge Biohazards Committee

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

Amendment #11 — Add Amendment #11 Here: That the salaries and expenses of the staff and consultants of the CBC under this ordinance shall be apportioned to the

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

d) Add Amendment #11 Here: institutions holding permits under this ordinance

IV. Permit Requirement

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manual which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

Amendment #5 Requested by the National Institutes of Health guidelines

V. The Institutional Biosafety Committee (IBC) ~~mandated by the "Guidelines"~~ shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

Amendment #6 totally and completely

X. The premises in which RDNA is used must be ~~effectively~~ free of rodent and insect infestation.

Section 11-8. Large Scale

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. Special Permit

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved the the CBC

and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

Amendment #7 3) The institution shall reimburse the City for the expense of this inspection and review including an apportionment of the salaries of the staff of the CBC under section 11-7, III subsections B) and C)

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic re-training and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. Cambridge Biohazards Committee (CBC)

I. Specific responsibilities of the CBC shall include:

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

Amendment #8 b) Approving all amendments to the "Guidelines" before their such implementation in Cambridge. In the event that the National Institutes of Health shall discontinue or abolish their Guidelines, those Guidelines in effect at the time of their discontinuance shall remain in effect in the City of Cambridge

Check this against amendment #4 c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. Restrictions

Amendment #9

I. RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

II. There shall be no deliberate release into the environment, that is, the sewers, drains or the air, of any organism containing recombinant DNA and further that any accidental release shall be reported to the Commissioner of Health and Hospitals within five days

Section 11-11. Penalties

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply ~~to the extent feasible~~). with the provisions of this ordinance

Amendment #10

Section 11-12. Severability of Sections

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

Note Environment - Definition - including but not limited to sewers drains air atmospheric

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

AN ORDINANCE

In amendment to an Ordinance formerly entitled "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by striking out the present Article II and substituting in place thereof a new Article II entitled "ORDINANCE FOR THE USE OF RECOMBINANT DNA TECHNOLOGY IN THE CITY OF CAMBRIDGE" which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. Guidelines for the Regulation of Recombinant DNA use.

I. Definitions

In the context of this ordinance the following definitions are adopted:

Amendment #1

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the ~~NIH~~ National Institutes of Health Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

Amendment #2

National Institutes of Health

3) Administrative Practices Supplement to the NIH Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

Amendment #3

Adopted by the National Institutes of Health

4) Such amendments to 1, 2, and 3 above as may be approved by the Cambridge Biohazards Committee.

Amendment #4

In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of their discontinuance, shall remain in effect in the City of Cambridge

II. Purpose

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. Cambridge Biohazards Committee

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC. Add Amendment #11 Heal

Amendment #11

That the salaries and expenses of the staff and consultants of the CBC under this ordinance shall be appropriated to the

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

d) Add Amendment #11 Ha

Institutions holding permits under this ordinance

IV. Permit Requirement

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manual which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

Amendment #5 Required by the National Institutes of Health guide

V. The Institutional Biosafety Committee (IBC) ~~mandated by~~ the "~~Guidelines~~" shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

Amendment #6

X. The premises in which RDNA is used must be ~~effectively~~ totally and completely free of rodent and insect infestation.

Section 11-8. Large Scale

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. Special Permit

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large scale RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large scale operations, for compliance with this ordinance "Guidelines". These

and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

Amendment #7 3) The institution shall reimburse the City for the expense of this inspection and review INCLUDING AN APPORTIONMENT OF THE SALARIES OF THE STAFF OF THE CBC UNDER SECTION 11-7, III SUBSECTIONS B) AND C)

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic re-training and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. Cambridge Biohazards Committee (CBC)

I. Specific responsibilities of the CBC shall include:

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

b) Approving all amendments to the "Guidelines" before their implementation in Cambridge. IN THE EVENT THAT THE NATIONAL INSTITUTES OF HEALTH SHALL DISCONTINUE OR ABOLISH SUCH GUIDELINES, THOSE GUIDELINES IN EFFECT AT THE TIME OF SUCH DISCONTINUANCE SHALL REMAIN IN EFFECT IN THE CITY OF CAMBRIDGE

Amendment #8

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

Check this against proposal #4

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. Restrictions

Amendment #9

I. RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

II. There shall be no deliberate release into the environment, that is, the sewers, drains or the air, of any organism containing Recombinant DNA and further that any accidental release shall be reported to the Commissioner of Health and Hospitals within five days

Section 11-11. Penalties

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply ~~to the extent feasible~~). With the provision

Amendment #10 of this ordinance

Section 11-12. Severability of Sections

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

Note Environment - Definition - including but not limited to sewers drains air atmospheric

City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-One

AN ORDINANCE

In amendment to an Ordinance formerly entitled "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Eleven entitled: "Health and Housing" is hereby amended by striking out the present Article II and substituting in place thereof a new Article II entitled Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge which reads as follows:

ARTICLE II.

ORDINANCE FOR THE USE OF RECOMBINANT
DNA TECHNOLOGY
IN THE CITY OF CAMBRIDGE

Section 11-7. GUIDELINES FOR THE REGULATION OF RECOMBINANT DNA USE

I. DEFINITIONS

In the context of this ordinance the following definitions are adopted:

a) Recombinant DNA molecules (RDNA) and organisms and viruses containing RDNA are those defined in the National Institutes of Health Guidelines promulgated in the Federal Register on November 21, 1980, and such amendments thereto as may be approved by the Cambridge Biohazards Committee.

b) An institution is any single individual, group of individuals or organization.

c) "Guidelines" are defined as:

1) National Institutes of Health Guidelines for Research involving Recombinant DNA Molecules published in the Federal Register of November 21, 1980.

2) National Institutes of Health Physical Containment Recommendations for large scale use of organisms containing Recombinant DNA molecules as published in the Federal Register of April 11, 1980.

3) Administrative Practices Supplement to the National Institutes of Health Guidelines for Research Involving Recombinant DNA Molecules as issued by the Office of Recombinant DNA Activities, November, 1980.

4) Such amendments to 1, 2, and 3 above adopted by the National Institutes of Health as may be approved by Cambridge Biohazards Committee. In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of such discontinuance, shall remain in effect in the City of Cambridge.

II. PURPOSE

All use of RDNA by institutions in the City of Cambridge shall be undertaken only in strict conformity with the "Guidelines", as defined above, and in conformity also with such other health regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

III. CAMBRIDGE BIOHAZARDS COMMITTEE.

a) A Cambridge Biohazards Committee (CBC) shall be established for the purpose of overseeing all use of RDNA in the City of Cambridge and of advising the Commissioner of Health and Hospitals and the Health Policy Board.

b) The CBC shall be composed of the Commissioner of Health and Hospitals or his/her designee, the Chairperson of the Health Policy Board or a board member designated by the Chairperson and a minimum of three other members to be appointed by the City Manager. The City Manager is authorized to provide for the adequate staffing of the CBC.

c) The CBC and the Commissioner of Health and Hospitals are empowered to retain competent professional assistance in carrying out their duties under this ordinance.

d) The salaries and expenses of the staff and consultants of the CBC under this ordinance shall be apportioned to the institutions holding permits under this ordinance.

IV. PERMIT REQUIREMENT.

a) All institutions proposing to use RDNA must obtain a permit from the Commissioner of Health and Hospitals with the approval of the CBC. Permit requirements include written agreement to:

1) Follow the "Guidelines".

2) Follow other conditions set forth in this ordinance.

3) Allow inspection of facilities and pertinent records by the Cambridge Biohazards Committee.

4) Prepare a Health and Safety manuel which contains all procedures relevant to the use of RDNA at all levels of containment in use at the institution. Said manual shall be submitted to the Cambridge Biohazards Committee for review.

5) Establish a training program of safeguards and procedures for personnel using RDNA.

V. The Institutional Biosafety Committee (IBC) required by the National Institutes of Health Guidelines shall have at least one member who is a nondoctoral person from a laboratory technical staff and one representative approved by the Health Policy Board. The IBC shall be the final arbiter within an institution, with regard to the implementation of this Ordinance and the "Guidelines".

VI. All minutes of the IBC meetings must be forwarded to the Commissioner of Health and Hospitals and the CBC. It shall also be the responsibility of the institution to file regular reports with the Cambridge Biohazards Committee, in a manner to be determined by the CBC.

VII. Institutions using RDNA shall perform adequate screening to insure the purity of the strain of host organisms used in the experiments and shall test organisms resulting from such experiments for their resistance to commonly used therapeutic antibiotics.

VIII. All institutions are to provide an appropriate medical surveillance program as determined by the Institutional Biosafety Committee for all persons engaged in the use of RDNA. Such programs must be approved by the CBC.

IX. The institution shall report within thirty (30) days to the CBC and the Commissioner of Health and Hospitals any significant problems with or violations of the "Guidelines" and any significant RDNA related accidents or illnesses.

X. The premises in which RDNA is used must be totally and completely free of rodent and insect infestation.

Section 11-8. LARGE SCALE

All institutions using RDNA on a "Large Scale" (as defined in the "Guidelines") must adhere to the following requirements in addition to those stated in Section 11-7.

I. SPECIAL PERMIT.

All institutions must obtain a special Large Scale Permit (LS Permit) from the Commissioner of Health and Hospitals with the approval of the CBC, after the Commissioner and the CBC have conducted an appropriate public hearing. LS Permit requirements include written agreement to:

a) Identify clearly all large sclae RDNA use in the IBC minutes.

b) Development procedures through the IBC for monitoring of large-scale operations, for compliance with this ordinance and the "Guidelines". These procedures shall be approved by the CBC and the Commissioner of Health and Hospitals.

c) 1) Allow an annual inspection and review of the procedures and practices of Large Scale RDNA use for compliance with this ordinance. The scope of this inspection and review shall be mutually agreed upon by the institution and the CBC.

2) The CBC shall retain a professionally competent person, persons, agency or institution to perform this inspection and review. The results shall be reported to the CBC, the Commissioner of Health and Hospitals and the institution involved.

3) The institution shall reimburse the City for the expense of this inspection and review including an apportionment of the salaries of the staff of the CBC under Section 11-7, III subsections (b) and (c).

d) Establish a Health-Safety Program for appropriate employees. Such a program is to include safety training, periodic re-training and periodic health surveillance. Details and procedures are to be established by each institution and approved by the CBC and the Commissioner of Health and Hospitals.

e) Advance approval must be given by the CBC for Large Scale uses of RDNA requiring P2 or P3 physical containment.

Section 11-9. CAMBRIDGE BIOHAZARDS COMMITTEE (CBC).

I. Specific responsibilities of the CBC shall include:

a) Establishing policies, procedures and criteria to aid in the implementation of this ordinance.

b) Approving all amendment to the "Guidelines" before their implementation in Cambridge. In the event that the National Institutes of Health shall discontinue or abolish their guidelines, those guidelines in effect at the time of such discontinuance shall remain in effect in the City of Cambridge.

c) Reviewing all proposals for RDNA use in the City of Cambridge for compliance with the "Guidelines" and conformity with such other regulations as the Commissioner of Health and Hospitals may from time to time promulgate.

d) Reviewing manuals and worker training programs and approving health-safety programs and monitoring procedures required by Sections 11-7 and 11-8.

e) Determining the manner in which institutions make reports or applications to the CBC, and the type of information required in such reports or applications. Reviewing reports, applications and recommendations by IBC and approving where appropriate. Carrying out site visits to institutional facilities.

f) Developing a procedure for members of institutions where RDNA is used to report to the CBC violations of this ordinance, the "Guidelines", or any other health regulations as the Commissioner of Health & Hospitals may promulgate.

Section 11-10. RESTRICTIONS.

I. RDNA use classified by the "Guidelines" as requiring P3 physical containment and biological containment greater than HV2 shall not be permitted without prior approval of the CBC. RDNA use requiring P4 containment shall not be permitted in the City of Cambridge.

II. There shall be no deliberate release into the environment, that is, the sewers, drains or the air, of any organism containing recombinant DNA and further that any accidental release shall be reported to the Commissioner of Health and Hospitals within five days.

Section 11-11. PENALTIES.

I. Violation of the conditions of this ordinance shall subject the violator to a fine of Two Hundred Dollars ($200.00) per day and in addition the facility in which the violation occurs may be closed by the Commissioner of Health and Hospitals. Each day of violation shall constitute a separate and distinct offense.

II. Once a permit has been issued it may be revoked by the Commissioner of Health and Hospitals only upon a determination (subject to judicial review) by the CBC and the Commissioner of Health and Hospitals after due notice and hearing, that the institution involved has materially failed to comply with the City Ordinance, the permit agreements or the "Guidelines" (not withstanding reasonable notice and an opportunity to correct such failures to comply with the provisions of this ordinance).

Section 11-12. SEVERABILITY OF SECTIONS.

If any section, sub-section, sentence, clause, phrase or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction such portion shall be deemed a separate, distinct and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

CAMBRIDGE CITY COUNCIL

CITY HALL, CAMBRIDGE, MASSACHUSETTS 02139

(617) 876-6800

David A. Wylie
City Councillor

MEMORANDUM

TO: Cambridge City Council
FROM: David Wylie, Chairman, Ordinance Committee
DATE: April 13, 1981

PROPOSED AMENDMENTS TO
PROPOSED DNA ORDINANCE

There follows the amendments which were discussed at the Ordinance Committee hearing held March 24, 1981:

1. Spell out National Institute of Health and insert wherever "NIH" appears.

2. Page 2 - Section I c) 4) - insert after the word "above" the words "which impose stricter or more restrictive requirements"

3. Page 3 - Section X - strike the word "effectively"

4. Page 5 - Section 11-11 II - delete the words "to the extent feasible"

5. Page 5, End - add the following additional section:

Section 11-13. City Employees.

a) Other than as required in the course of their city employment, no employee of the City of Cambridge may become involved, directly or indirectly, by ownership, contract, compensation, voluntary service or otherwise, in any institution, company, business or facility which is subject to this Ordinance with respect to the subject matter of the Ordinance.

b) At any time when the position of Commissioner of Health and Hospitals is not filled the duties and responsibilities of such person contained in this Ordinance shall be performed by the acting Commissioner of Health and Hospitals.

CITY OF CAMBRIDGE

CITY HALL, CAMBRIDGE, MASSACHUSETTS 02139 • (617) 498-9020

LAW DEPARTMENT

RUSSELL B. HIGLEY
CITY SOLICITOR

MICHAEL C. COSTELLO
ASSISTANT CITY SOLICITOR

EDWARD A. CUNNINGHAM
ANDREW T. TRODDEN
SEVERLIN B. SINGLETON
DAVID B. O'CONNOR
LEGAL COUNSEL

CHARLES A. WATSON
LEGISLATIVE AGENT

April 14, 1981

Paul E. Healy
City Clerk
City Hall
Cambridge, MA 02139

Re: Proposed amendments to General Ordinances, Chapter 11, Article II: Ordinance for the Use of Recombinant DNA Technology in the City of Cambridge

Dear Mr. Healy:

Please be advised that I have reviewed the six proposed changes submitted by the Ordinance Committee with regard to the DNA ordinance and find them all acceptable.

Referring to Section 11-11. Penalties, part II, I recommend the following language to revise the last two lines:

"(notwithstanding reasonable notice and an opportunity to correct such failures <u>to comply with the provisions of this ordinance</u>.)" (Revised section underlined).

Very truly yours,

Russell B. Higley

Russell B. Higley
City Solicitor

RBH:ln

11. O-11

Comm. from Russell B. Higley , City Solicitor re: the proposed changes in the DNA ordinance.

In City Council,

April 27, 1981

4/27/81

Placed on File

4/27/81

Passed to be ordained as amended

8-1-0