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Research Integrity and Assurance

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Institutional Biosafety Committee Annual Report, July 1, 2022 - June 30, 2023

Executive Summary:

The IBC reviews and approves research activities at Cornell University involving the use of r/sNA and biohazardous materials in research. The IBC manages 314 research labs comprising 2527 research personnel with containment practices ranging from Biosafety Level (BSL)-1 through BSL-3. The IBC continues to see increased activities in higher containment BSL-3/ABSL-3 laboratories, increased studies in the interactions between plants and plant pests, and greatly increased projects involving the use of CRISPR/Cas9 gene editing in diverse organisms. IBC member recruitment continues to be a challenge - finding qualified Principal Investigators (PIs) to join the committee in the areas of research the committee covers. In addition, discussions and recommendations occurring at the Federal level that may expand the definition of Dual Use Research of Concern (DURC) and Potential Pandemic Pathogen Care and Oversight (P3CO) projects, would lead to an increase in the number of qualifying agents in Cornell's research portfolio and add further requirements to the review and complexity of the approval of work with these agents. However, overall, the number of requests to the IBC for review are stabilizing after a long period of increased requests, but there has been an increase in the number of reviews for more

complicated and higher safety level research – including the addition of four more pathogens that fall under the Federal Select Agents Programs (FSAP).

1. Charge to the IBC

Cornell University's Institutional Biosafety Committee (IBC) is responsible for reviewing University research activities that are conducted by faculty, staff, students, or visiting scientists at, or under the auspices of, Cornell University's Ithaca campuses (Ithaca, Geneva) as well as the Boyce Thompson Institute, and that involve the use of recombinant or synthetically derived nucleic acid molecules (r/sNA) or other biohazardous materials (regulated human, animal and plant pathogens, and biological toxins). The review process is initiated by submission of a Memorandum of Understanding and Agreement (MUA) to the IBC. The purpose of this review process is to ensure that all activities involving r/sNA or other biohazardous materials, and the facilities used to conduct such work, comply with all applicable external regulations and University policies. The IBC's objective is also to ensure that such activities meet standards of good biological safety practice emphasizing protection of personnel, the public, and the environment. The IBC assists researchers in meeting their responsibilities, imposes requirements, and reviews and approves policies, procedures, programs, and facilities pursuant to the safe use of r/sNA or other biological materials. For a copy of the Charge to the IBC, please see: https://researchservices.cornell.edu/sites/default/files/2020-05/IBC_Charge.pdf

2. Committee Membership

The committee is currently Chaired by Professor Colin Parrish. ***Appendix A provides the membership list as of June 30, 2023.*** Finding new members who are knowledgeable in the different areas of the IBC's oversight is a continuing challenge, and it is often difficult to recruit members from some large departments that send us many applications to review. Over the course of the year, the following membership changes occurred:

- John Clarke MD, Director of Occupational Medicine, Cornell Health Services left the committee after leaving the University.
- Bhupinder Singh DVM, CARE-CVM, Veterinarian and *ex officio* voting member left the committee after leaving the University.
- Sara Carpenter MS, MAT, Research Support Specialist, Plant Pathology & Plant-Microbe Biology Section, is leaving the committee when her appointment ends in June 2023.
- Stephanie Mattoon MPH, Associate Biosafety Officer, Environment, Health and Safety (EHS), alternate *ex officio* voting member to the Biosafety Officer, has left the committee after leaving the university.
- Hannah Glaspell MPH, Biosafety Specialist, EHS, alternate *ex officio* Voting member to the Biosafety Officer, has left the committee after leaving the university.
- Beth Bennett DVM, CARE-CVM, has joined the committee as the Veterinarian and *ex officio* voting member.
- Richard Gaisser MS, Biosafety Specialist, EHS, has joined the committee as an alternate *ex officio* voting member to the Biosafety Officer.
- Brendan Chandler MS, Biosafety Specialist, EHS, has joined the committee as an alternate *ex officio* voting member to the Biosafety Officer.
- Julie Conyer, Associate Biosafety Officer, EHS, has joined the committee as an alternate *ex officio* voting member to the Biosafety Officer.

- Luis Schang, Professor, James A Baker Institute for Animal Health, Microbiology &Immunology, has been reappointed to the committee for another three year term through June 2026.
- Georg Jander, Adjunct Professor, Plant Biology Section, Boyce Thompson Institute, has been reappointed to the committee for another three year term through June 2026.
- Ping Wang, Professor, Entomology, has been reappointed to the committee for another three year term through June 2026.
- Christy Michaels, Community Member, has been reappointed to the committee for another three year term through June 2026.
- Cathy Moore, Community Member, has been reappointed to the committee for another three year term through June 2026.
- Colin Parrish, James A Baker Institute for Animal Health, Microbiology and Immunology, has been reappointed to the committee as member and as Chair for another three year term through June 2026.
- Edward Koppel, Cornell Occupational Medicine, has been appointed to the committee as *ex officio* voting member for Occupational Medicine.
- Lisa Cope, Cornell Occupational Medicine, has been appointed to the committee as the alternate *ex officio* voting member for Occupational Medicine.
- Julie Siler, Public and Ecosystem Health, has been appointed to the committee as a voting member through June 2026.

3. Active Projects

The IBC reviews and approves the following categories of projects (detailed explanations of these classifications are provided in ***Appendix B***):

a. **Projects with r/sNA Use:**
- Exempt from the NIH guidelines (Section F)
- Non-Exempt, subject to NIH guidelines (classified as Section D or Section E)

b. Projects with Biohazardous Materials
- Infectious/pathogenic agents classified in the following categories: Risk Group 2, 3, and 4 bacterial, fungal, parasitic, viral, rickettsial or chlamydial agents as defined by the National Institutes of Health (NIH) **or**,
- Other agents that have the potential for causing disease in healthy individuals, animals, or plants, **or**
- Toxins of biological origin, which include metabolites of living organisms and materials, rendered toxic by the metabolic activities of microorganisms (living or dead).

c. Active Projects Registered with the IBC:
As of June 30, 2023, there were 317 active MUAs: 308 MUAs at BSL-1 or BSL-2 and 9 MUAs at BSL-3.

Classification	Type	MUAs Active
Exempt	Section F	15
	Section F with Biohazards	14
Non-Exempt	Section D	39
	Section D with Biohazards	143
	Section E	30
	Section E with Biohazards	20
	Biohazards only	47
Biosafety Level 3 practices		9
Active as of June 30, 2023		**317**

4. Initiatives Managed or Supported by the IBC

The IBC and EHS Biosafety have completed a request from the U.S. National Authority for the Containment of Poliovirus (NAC) at the Centers for Disease Control and Prevention (CDC) to participate in the National Inventory for Poliovirus Containment. The IBC identified 35 Cornell researchers who currently or in the past may have tested, extracted, handled, or stored biological samples from humans, experimentally infected animals, sewage, or environmental waters that may meet the criteria for potentially infected material. These researchers were contacted by the CDC to complete the inventory survey, and Cornell has reached 100% reporting to the CDC. The Poliovirus Inventory Statement of responsibility and preparation for U.S. Institutions has been completed by Cornell and returned to the CDC completing this project. The statement of assurance provided to the NAC requires that we deliver information to researchers about work with materials which may contain potentially infectious materials (PIM) and inform the NAC if new materials are found. We anticipate a fourth round of containment guidance from CDC, which is based on the World Health Organization's Global Action Plan for Poliovirus Containment.

5. Initiatives Managed or Supported by ORIA for the IBC

Changes to ORIA-IBC staff:

- Erica Dunayer, Ph.D., left her role as the Institutional Biosafety Committee Administrator.
- Amy Wells joined as the Institutional Biosafety Committee Administrator.
- Michael Betteken, Ph.D., CPBSCA, Senior IBC Administrator has become a Certified Professional in Biosafety Compliance Administration (CPBSCA) through the Biosafety Administrators Association.

Projects:

- **Routine Audit by University Audit Office**. Between May and December of 2021, the IBC underwent a routine periodic audit by the University Audit Office. The purpose of this review was to identify and assess key components of the overall system of internal controls for the IBC and to test compliance with relevant university policies and the NIH Guidelines for Research Involving r/sNA. The review leveraged the NIH IBC Self-Assessment tool and

included a review of various procedures designed to understand and assess different aspects of the operating environment and associated internal controls, including:

- Inquiries of and discussions with responsible management
- Review of documented policies and procedures
- Testing of controls and supporting documentation

The scope of the review included the following areas:

- IBC Structure and Organization
- Policies and Procedures
- Roles and Responsibilities
- MUA Review and Oversight Process
- Outreach, Training, and Awareness
- Surveillance, Emergency Planning, and Response
- Incident Reporting

The review identified numerous areas where the IBC had positive testing results and/or notable strengths which included but were not limited to:

- A formal charge defines the role of the committee.
- Meetings occur on a regular basis with well-documented minutes.
- IBC is properly registered with the NIH and meets membership requirements.
- All MUAs that were checked by the audit office were reviewed and approved by the IBC in accordance with policies and procedures.
- All incidents were appropriately reported to the NIH in a timely manner.
- New IBC members are trained appropriately.

The review also identified a few areas for the IBC to improve on, with many of these areas having already been identified by the IBC as areas for improvement. These areas for improvement are summarized below:

- A new and modern software system is needed to better manage electronic submissions and documentation for the IBC.
- A comprehensive review of how required biosafety training is assigned, documented, verified, and monitored is needed, particularly at the BSL-2 level (BSL-3 training is now well organized). Currently, PIs are responsible for assigning training and ensuring that training is taken, but IBC systems are not capable of pulling this information from the University learning management system, CULearn.
- Documented procedures are needed for monitoring BSL-3 facility access and incident reporting to the NIH.
- A university-wide policy for research activities covered by the IBC is needed, developed through the University Policy Office.

A plan to address the findings in the audit was submitted and accepted by the Cornell Audit office.

Audit Update: Many of the requested changes and enhancements from the Audit office have been completed. An incident reporting procedure has been developed, accepted, and implemented by the IBC. An FAQ section has been added to the IBC website, and a BSL-3 facility access and monitoring policy has been implemented. Remaining areas that are being actively worked on are to develop and implement a new and modern software system to manage electronic submissions to the IBC (see below). Additionally, a comprehensive review of the biosafety training, and associated documentation and monitoring is underway. We

are currently evaluating limitations of CULearn to determine whether we can address issues resulting from technology limitations. Procedures and manual documentation have been put in place to address deficiencies identified during the audit regarding BSL-3 training records.

- **New Software System for IBC Application.** ORIA leadership and IBC staff are currently working with Cayuse to develop a new system to replace the current eMUA system. A direct communication and integration with the Cayuse Animal Management system is a feature of the Cayuse Hazards Safety system which is currently being evaluated. The new system prioritizes several integrations with Cornell systems (RASS, CULearn, and others) to allow for a better user experience. A dashboard feature will also make researcher, administrator, and committee member tasks easier to identify.

6. Initiatives managed or supported by EHS Biosafety for the IBC

The Biosafety team, operating within the Research Safety Section of Environment, Health and Safety, collaborates extensively with the Institutional Biosafety Committee (IBC), Principal Investigators, and research center directors. Under the guidance of the Biological Safety Officer, this team of four individuals undertakes various critical responsibilities. They are responsible for developing comprehensive guidelines, maintaining the Biological Safety Written Programs, and ensuring the effective management of biological risk across campus. Additionally, the team oversees the Select Agents Program, which entails stringent regulation and monitoring of high-risk biological agents.

The team ensures the availability of general biosafety training for all users and performs regular laboratory safety assessments. Team members deliver training via Cornell's learning management system or live training sessions. Live training runs a gamut from classroom settings to research laboratories, to facilitate more focused and specialized training. In the past year, 360 persons have completed BSL-2 training, and 2518 research and diagnostic personnel have completed bloodborne pathogen training. Regular laboratory assessments are conducted by the team, employing a risk-adapted model that prioritizes more frequent inspections for facilities with higher containment requirements and less frequent inspections for facilities with lower containment requirements within a 2-year cycle. During the period from June 30, 2022 to current, 434 laboratory assessments have been completed in laboratories containing biological materials. Training and lab assessment services extend to the USDA-ARS at both the Ithaca and Geneva locations, Boyce Thompson Institute, and various incubator facilities across Cornell. The biosafety team is also the primary group that investigates any incident involving biological or recombinant materials on campus.

The Biosafety Officer also serves as the primary liaison with regulatory bodies such as the Centers for Disease Control and Prevention (CDC), the United States Department of Agriculture (USDA), and the New York State Department of Health (NYS DOH), ensuring effective communication and regulatory compliance. The Biosafety Officer and Biological Safety Administrators share responsibility for communication with the NIH Office of Science Policy.

Their collaboration in maintaining biosafety practices with stakeholders inside the university and these external entities underscores their commitment to fostering a culture of safety and responsible research. Through their role as a liaison with regulatory agencies, their contributions to risk assessments, training programs, and oversight of external entities, the Biosafety team demonstrates their essential role in ensuring the integrity, safety, and compliance of our research activities. Their

dedication to maintaining strong relationships with regulatory bodies, upholding regulatory standards, and promoting responsible research practices exemplify our institution's commitment to excellence and innovation in biosafety.

7. MUA (Project) review and activities

During the reporting year June 1, 2022 - June 30, 2023, the IBC held 11 duly convened meetings to review new MUAs, amendments to approved MUAs, and applications for renewal of approved MUAs.

- **Review of Exempt Projects:** The Chair of the IBC, another designee, or the Biosafety Officer reviews and confirms the classification of projects that are exempt from the NIH Guidelines and approves the submission. If there are questions raised, additional review is carried out by those participants. Exempt MUAs are reported to the IBC at a subsequent meeting but do not need ongoing oversight.
- **Review of Non-Exempt MUAs and MUAs with Biohazards:** These projects are assigned for review to a subcommittee of at least three members, one of whom prepares a summary of the project. The projects are then discussed by the full committee at a convened meeting, which issues the formal approval. Approvals are granted for a period of three years, although continued approvals are contingent upon the successful completion of annual reviews and amendments.
- **Review of Biosafety Level 3 (BSL-3) Applications:** BSL-3 Applications are reviewed by the BSL-3 Review Committee (BRC), which is composed of the Biosafety Officer and Biosafety team members, CVM Director of Biocontainment Operations, Occupational Medicine Physician, and at least two IBC members. The BRC makes recommendations to the Principal Investigator (PI) for improving the application and outlines the required training and other requirements before the project can be approved. Based on these findings, appropriate classroom and facility on-site training is delivered. An Occupational Medicine evaluation is conducted, and a corresponding exposure control plan is put into place. The IBC reviews all the recommendations and actions undertaken to address those recommendations and determines if the project can be approved for BSL-3 work. Three review pathways exist to evaluate proposed work based on risk. All new BSL-3 applications are reviewed by the BRC and discussed and approved at an IBC committee meeting. To add flexibility, two additional review pathways were added, including a DMR process which permits the BRC to review and approve amendments with minor changes to BSL-3 work and a Biosafety Officer (BSO) review pathway to review and approve administrative changes to BSL-3 work. A detailed policy and procedure was developed to define the process and characterize what kinds of research can qualify for each review pathway.
- **Annual Questionnaires and MUA amendments:** Review is by the Chair of the IBC, designated committee member, or Biosafety Officer, and the IBC administrators. Amendments with only personnel changes are approved administratively. Amendments that add a new scope of research or work requiring a more thorough review are reviewed at a regularly scheduled full committee meeting.

A total of 437 MUAs or continuation requests (amendments and annual questionnaires) were reviewed during the 2022-23 cycle. A breakdown of projects submitted for review during the same periods in 2020-2021 and 2021-2022 is below:

Classification	Type	Number reviewed during 2020-2021	Number reviewed during 2021-2022	Number reviewed during 2022-2023
Exempt	Section F	3	1	1
	Section F with Biohazards	6	4	3
Non-Exempt	Section D	2	13	23
	Section D with Biohazards	41	71	39
	Section E	11	11	15
	Section E with Biohazards	8	3	8
BSL-3 Application		6	1	6
BSL-3 Amendment		13	13	9
Biohazards only		17	23	17
Annual Reviews		169	156	168
Amendments		179	206	172
Total reviewed		456	502	437
MUAs Terminated		9	16	29

8. Adverse Events

There were 3 adverse events in total that occurred in the past reporting period involving the use of r/sNA materials. The events were all reported to the NIH Office of Science Policy in accordance with the NIH guidelines for r/sNA. All reports were accepted by the NIH with no further information requested. Further details about the incidents can be found below.

Adverse Events Reported to the NIH-Office of Science Policy (OSP):

1. At 1:29 am on Saturday, July 23, 2022, a fire was reported in a BSL-2 laboratory that housed research for two principal investigators. The Ithaca Fire Department responded to the lab to suppress the fire. Extinguishing the fire required using handlines and approximately 1000 gallons of water.

Both principal investigators had work that used various recombinant materials, including modified human and murine cell lines, replication-incompetent adeno-associated vectors, replication-incompetent adenoviral vectors, second and third generation replication-incompetent lentiviral vectors, modified *Escherichia coli* K-12 derivatives, and modified *Saccharomyces cerevisiae*. Recombinant materials were contained in the research laboratory's freezers, refrigerators, and incubators. Although most of these units remained intact, there is a possibility that during the fire suppression, water may have washed some recombinant materials into the laboratory.

The laboratory affected by the fire was on the second floor of a multistory building. The heat from the fire was sufficient to cause minor structural damage to the building and likely provided containment for any materials that may have been inadvertently released. Much of the water exited the lab to the first floor and the elevator mechanical pit sump systems. Affected areas on the first floor included a lecture hall and office space. Both locations had carpet and upholstery. Bulk water was collected by a commercial remediation company immediately after the fire and disposed of into sanitary sewer. The Ithaca Wastewater Treatment Plant uses chlorine disinfection as part of the process, which should also be sufficient for the materials of concern that may have been present in the water from the fire. The carpeted and upholstered surfaces were disinfected with an accelerated hydrogen peroxide disinfectant applied with tank sprayers by the CVM Director of Biocontainment and the University Biosafety Officer to alleviate any concerns about recombinant materials. These surfaces were allowed to dry. All upholstery and carpet were removed from offices and the lecture hall on the first floor and these spaces were restored and are back in use. Remodeling continues in the 2nd floor laboratory spaces, encumbered by asbestos abatement. Fire suppression is being installed as part of the remodel, with planned installation of fire suppression in other spaces in the building.

The State Fire Inspector determined the cause of the fire was malfunction of a recirculating refrigerated water bath used to chill a Western blot apparatus. There was no automatic fire suppression installed in this laboratory.

Both Principal Investigators were able to remove some of their research materials from the laboratories; the majority was autoclaved in Cornell's College of Veterinary Medicine Waste Management Facility.

Firefighters responding to the scene were equipped with typical turnout gear and SCBA respirators. In addition, personnel in the space after the fire and during clean-up wore N95, powered air purifying, or full-face elastomeric respirators to protect themselves from fire residues and ash.

No illness has been reported from the firefighters or personnel in the space after the fire.

The NIH accepted the report and had no further requests for information.

2. On Thursday, September 15, 2022 at 8:20 pm a graduate student working in a BSL-3 laboratory noticed that one of the roller bottles they had previously inoculated with *Mycobacterium tuberculosis* had leaked into the roller bottle incubator. No other persons were present in the facility. The student was wearing proper PPE including scrubs, gloves, safety glasses, and a respirator at the time of the leak's discovery. The student exited the laboratory, doffing their outer PPE as they exited the facility, per facility protocol. The *Mycobacterium tuberculosis* was a derivative of the Erdman strain constitutively expressing luciferase from the *lux*CDBAE operon.

After exiting the facility, the student proceeded to the facility shower. After showering, they notified the CVM Director of Biocontainment for assistance with clean up. The CVM Director of Biocontainment informed the University Biosafety Officer (BSO). As the CVM Director of Biocontainment was out of the immediate area, the BSO returned to campus, met with the student, and proceeded to clean up the spill. These notifications and clean up were as per Cornell's spill response protocol for a spill in a BSL-3 facility outside of primary containment.

All PPE-facility specific scrubs, shoes, socks, Tyvek wrap, an N95 respirator, and gloves remained intact and were not visibly contaminated. The student did handle roller bottles located in the incubator directly below the bottle that leaked, leading to the conclusion that they were likely to have encountered dried culture materials which may have contained *Mycobacterium tuberculosis*. Cornell has characterized this instance as a release outside of primary containment in a BSL-3 facility with an RG-3 genetically modified organism with a low likelihood of potential exposure.

No deviations from the research or institutional protocols were noted during the response and review of this incident. The research is currently approved by the Cornell IBC. All training for this graduate student is up to date and consistent with Cornell expectations.

The PI, graduate student, and BSO have each reviewed the incident. During that review, it was discovered that other roller bottles within the case of disposable roller bottles were cracked. The remainder of the case of roller bottles were discarded.

All persons who are part of the research team that works with *Mycobacterium tuberculosis* at Cornell are part of annual medical surveillance with Cornell Health, Occupational Medicine. When a potential exposure occurs, the individual(s) involved are given a QuantiFERON-TB Gold test soon after the potential exposure with a second QuantiFERON-TB Gold test 8-10 weeks after the first. No illnesses were reported from this event.

The supplier of the roller bottles was not able to provide information about the failure rates of their product.

The NIH accepted the report and had no further requests for information.

3. At 1:25 pm on Thursday, December 1, 2022, an undergraduate student working in a BSL-2 lab was cut on their right palm with a glass Pasteur pipette contaminated with a genetically modified *Salmonella enterica* subspecies *enterica* serovar Typhimurium strain ATCC14028. Genetic modification of the bacterium comprised deletion of three virulence associated loci: *hil*D, *hil*C and *rts*A. Each locus contributes to the expression of genes from the *Salmonella* Pathogenicity Island 1. The student was cut while removing a pipet tip from the end of the Pasteur pipet. While removing the tip, the Pasteur pipet was broken, and the student grazed their palm with the broken Pasteur pipet.

   After the injury, the student stopped their work, removed gloves, washed with soap and water, and sprayed their hands with ethanol. The student proceeded to the local emergency department at Cayuga Medical Center which determined that no treatment was necessary. No further first aid was applied, or medical treatment sought.

   The incident was reported to the lab manager and the principal investigator (PI). The incident (#5469) was reported within 24 hours to Cornell University Environment, Health and Safety (EHS)

through the university's electronic incident reporting system, informing the university Biosafety Officer (BSO). The student, lab manager, principal investigator, and BSO met in person and exchanged emails to determine the nature of the exposure and potential corrective actions. The relevant institutional training completed by the student includes Laboratory Safety and Biosafety Training. Personnel take the online training and are then trained in-person by other experienced students, staff, or postdocs in the lab, with oversight by the laboratory manager and Principal Investigator. There were no deviations from training. This student has also worked in the lab for several years and is well-informed about the risks of working with *Salmonella*. There was no apparent deviation from lab SOPs or institutional biosafety approval.

Personal protective equipment and engineering controls used at the time include a fabric lab coat and gloves. Work was performed in a Class II Type A2 biosafety cabinet. There were no apparent engineering control or PPE (Personal Protection Equipment) failures. Beyond the cut received by the student, there is currently no additional reported illness.

To prevent similar incidents in the future, the lab is no longer using glass Pasteur pipets to aspirate samples, eliminating the hazard from the workflow. There were no reported illnesses from this event.

The NIH accepted the report and no further requests for information.

9. Ongoing Education and Training for IBC members

All new members of the IBC were provided an orientation on the NIH guidelines and risk assessment of the use of biohazardous materials.

Ongoing Education and Updates to the Committee:

- A summary of the activities of the Novel and Exceptional Technology and Research Advisory Committee (NExTRAC) was provided to the committee. This advisory body provides recommendations to the NIH Office of Science Policy for updates to the NIH Guidelines for r/sNA. The advisory body is currently working on policy recommendations for Data Science and Emerging Technology to develop policy framework around data (digital health device data, HIPPA controlled data, and data access) with regards to participant privacy and promoting data access. The current charge of this group does not appear to have any impacts on the functions of the IBC. The Cornell IRB, which handles participant data security, is monitoring the developments of the recommendations from this current charge.
- The committee has been updated on the recommendations of the National Science Advisory Board for Biosecurity (NSABB) from the working groups for the review and evaluation of Potential Pandemic Pathogen Care and Oversite (P3CO) policy and the working group to review and evaluate Dual Use Research of Concern (DURC). The group has issued a report with a series of recommendations expanding the scope of each policy to include additional infectious agents, many of which are used at Cornell, that are currently not subject to these policies. The IBC and EHS Biosafety are currently monitoring for when the draft policies will be available for each and will plan to adjust our program as needed.
- Education of newer IBC members continued by combined efforts from IBC staff and EHS Biosafety to provide training and guidance documents for various biosafety and containment practices of interest to members.

10. Appendix A: Current Committee Membership

Voting Members

Colin Parrish Ph.D. (Chair)	Professor, James A Baker Institute for Animal Health, Microbiology & Immunology
Georg Jander Ph.D.	Adjunct Professor, Plant Biology Section
Christy Michaels MS	Biology Teacher, Community Member, Non-affiliated
Cathy Moseley Moore MS	Enrichment Teacher, Community Member, Non-affiliated
Jeffrey Pleiss Ph.D.	Assoc. Professor, Molecular Biology and Genetics
Bryan Swingle Ph.D.	Asst. Professor, Plant Pathology & Plant-Microbe Biology Section
Luis Schang Ph.D.	Professor, James A Baker Institute for Animal Health, Microbiology & Immunology
Ping Wang Ph.D.	Professor, Entomology
Xiaohong Wang Ph.D.	Professor Courtesy, Plant Pathology & Plant-Microbe Biology
Laura Goodman Ph.D.	Asst. Research Professor, Department of Public & Ecosystem Health
Julie Siler MS	Research Technician, Department of Public & Ecosystem Health

Ex-Officio, Voting Members

Joshua Turse Ph.D., CBSP(ABSA)	Biological Safety Officer, Environment, Health and Safety
Paul Jennette MS, PE	Biosafety Engineer, CVM Biosafety Program
Beth Bennett DVM	Clinical Veterinarian, Center for Animal Resources and Education
Ed Koppel MD	Occupational Medicine, Cornell Health Services

Ex-Officio, Alternate Voting Members

Julie Conyer	Associate Biosafety Officer, Environment, Health and Safety
Bryant Blank DVM	Clinical Veterinarian, Center for Animal Resources and Education
Richard Gaisser MS	Biosafety Specialist, Environment, Health and Safety
Brendan Chandler MS	Biosafety Specialist, Environment, Health and Safety
Lisa Cope RN	Nurse Practitioner, Occupational Medicine Nurse

Ex-Officio, Non-Voting Members

Rhoda Maurer MS	Manager, Tower Road Greenhouses, CALS
Krystyn Van Vliet Ph.D.	Vice President for Research and Innovation - Institutional Official
Eve DeRosa Ph.D.	Dean of Faculty
Christine Bellezza DVM	Director of Research Assurance

Administrative Support Staff

Michael Betteken Ph.D., CPBCA	Senior IBC Administrator
Amy Wells	IBC Administrator
Kelsy Earl	IACUC/IBC Compliance Assistant

11. Appendix B: Classification definitions from the NIH guidelines

Exempt Experiments

Section III-F.

Recombinant or synthetic nucleic acid molecules described in Section III-F are exempt from the *NIH Guidelines,* but registration with the Institutional Biosafety Committee is still required to ensure that they are correctly classified.

Non-Exempt Experiments

Section III-E. Experiments that Require Institutional Biosafety Committee Notice Simultaneous with Initiation

Experiments not included in Sections III-A, III-B, III-C, III-D, III-F, and their subsections are considered in Section III-E. All such experiments may be conducted at BL1 containment. For experiments in this category, a registration document shall be dated and signed by the investigator and filed with the local Institutional Biosafety Committee at the time the experiment is initiated. The Institutional Biosafety Committee reviews and approves all such proposals, but the Institutional Biosafety Committee review and approval prior to initiation of the experiment is not required (see Section IV-A, *Policy*). For example, experiments in which all components derived from non-pathogenic prokaryotes and non-pathogenic lower eukaryotes fall under Section III-E and may be conducted at BL1 containment.

Section III-D. Experiments that Require Institutional Biosafety Committee Approval Before Initiation

Prior to the initiation of an experiment that falls into this category, the Principal Investigator must submit a registration document to the Institutional Biosafety Committee which contains the following information: (i) the source(s) of nucleic acid; (ii) the nature of the inserted nucleic acid sequences; (iii) the host(s) and vector(s) to be used; (iv) if an attempt will be made to obtain expression of a foreign gene, and if so, indicate the protein that will be produced; and (v) the containment conditions that will be implemented as specified in the *NIH Guidelines*. For experiments in this category, the registration document shall be dated, signed by the Principal Investigator, and filed with the Institutional Biosafety Committee. The Institutional Biosafety Committee shall review and approve all experiments in this category prior to their initiation. Requests to decrease the level of containment specified for experiments in this category will be considered by NIH.

12. Appendix C: Number of Active MUAs by Unit/Department

Colleges and Departments	Count of MUA#
AGRICULTURE & LIFE SCIENCES	**108**
Academic Programs CALS	1
Animal Science	7
Biological and Environmental Engineering	6
Biological Statistics & Computational Biology	1
CALS Dean-Administration	1
CALS Research Office	1
Crop and Soil Sciences	1
Ecology and Evolutionary Biology	1
Entomology	9
Food Science	11
Horticulture	5
Microbiology	7
Molecular Bio and Genetics	13
Neurobiology & Behavior	4
Nutritional Sciences AG	5
Plant Biology	14
Plant Breeding	3
Plant Pathology	18
ARTS AND SCIENCES	**41**
Chemistry And Chemical Biology	11
Ecology And Evolutionary Biology	1
Molecular Bio and Genetics	14
Neurobiology & Behavior	8
Physics	2
Plant Biology	1
Psychology	4
BOYCE THOMPSON INSTITUTE	**12**
Boyce Thompson Institute	12
ENGINEERING	**44**
Applied & Engr Physics	4
Biomedical Engineering	22
Chemical and Biomolecular Engineering	6
Civil & Environmental Engineering	4
Materials Science & Engineering	3
Mechanical & Aerospace Engineering	5

HUMAN ECOLOGY	**11**
Human Ecology Administration	1
Nutritional Sciences	10
RESEARCH-CENTERS	**5**
Weill Institute for Cell and Molecular Biology	5
VETERINARY MEDICINE	**92**
Baker Institute for Animal Health	11
Biomedical Sciences	15
Clinical Sciences	13
Microbiology & Immunology	22
Molecular Medicine	11
Population Medicine & Diagnostic Sciences	19
Quality Milk Production Services	1
VP/RESEARCH	**4**
Institute for Biotechnology & Life Science Tech	3
Vice President For Research and Innovation	1
Grand Total	**317**

13. Appendix D: Research Personnel Registered with the IBC

The IBC provides relevant biosafety information to researchers on the best practices for work with r/sNA, biohazardous materials, and bloodborne pathogens. The IBC staff and EHS Biosafety coordinate and verify training for work with bloodborne pathogens, which per OSHA regulations, must be renewed annually for all individuals working with those materials. Below are the total number of research personnel registered with the IBC, which includes PIs, post-docs, lab support staff, and graduate and undergraduate students. The distribution of research personnel working with various materials is also reflected in the table below, along with the percentage of total personnel working with those materials.

	Number of research personnel	**Percentage working with material**
Total number of researchers registered with the IBC	**2527**	**-**
Number working with r/sNA	**1887**	**74%**
Number working with Biohazardous materials	**1726**	**68%**
Number working with Bloodborne pathogens	**1055**	**42%**