Cornell University
Office of
Research Integrity and Assurance
Institutional Biosafety Committee

395 Pine Tree Road Suite320
Ithaca, NY 14850
Phone: 607-255-0741
Fax: 607-255-0758
Email: cu_ibc@cornell.edu
https://researchservices.cornell.edu/compliance/rsna-or-biohazardous-research

Institutional Biosafety Committee
Annual Report, July 1, 2020 - June 30, 2021

Contents

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), 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 these reviews 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, and was Co-Chaired by Prof. Esther Angert during 2020 and the first period of 2021. ***Appendix A provides the membership list as of June 30, 2021.*** Finding new members who are knowledgeable in the different areas of the IBC's oversight is a continuing challenge, and we often lack members from some large departments that send us many applications to review. Over the course of the year, the following membership changes occurred:

- The appointments of the following current IBC members were renewed for a one year term: Anthony Hay, Associate Professor, CALS – Microbiology ending June 2022.
- Jeffrey Pleiss, Associate Professor, CAS - Molecular Biology and Genetics was appointed to the IBC through June 2024.
- Xiaohong Wang, Associate Professor, USDA-ARS Robert W. Holley Center for Agriculture & Health was appointed to the IBC through June 2024.
- Hannah Glaspell, Biosafety Specialist was appointed as an *ex officio*, alternate voting member to Dr. Joshua Turse.
- Sara Carpenter, Research Support Specialist, Plant Pathology & Plant-Microbe Biology was appointed to the IBC through June 2023.
- Esther Angert, Professor, Microbiology, CALS- Microbiology stepped down from the committee (and Co-Chair position) to become an Associate Dean in CALS.
- Matthew Willmann, Director of the Plant Transformation facility stepped down from the committee to pursue a new position in industry.
- David Russell, Professor, CVM- Microbiology and Immunology stepped down from the committee prior to his term expiring.
- Jane Lee, Research Support Specialist, stepped down from the committee to become Department Manager of CVM- Biomedical Sciences.

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, 2021, there were 323 active MUAs: 315 MUAs at BSL1 or BSL2 and 8 MUAs at BSL3.

Classification	Type	MUAs Active
Exempt	Section F	34
	Section F with Biohazards	12
Non Exempt	Section D	26
	Section D with Biohazards	134
	Section E	33
	Section E with Biohazards	31
	Biohazards only	45
Biosafety Level 3 practices		8
Active as of June 30, 2021		**323**

4. *Initiatives managed or supported by the IBC*

The IBC Chair received 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. These researchers were contacted by the CDC to complete the inventory survey. The IBC Administrator worked with the CDC in an effort to complete the remaining surveys this spring.

5. *Initiatives managed or supported by ORIA for the IBC*

Changes to ORIA-IBC staff:

- Christine Bellezza, DVM, was appointed as Director of Research Assurance overseeing the IBC, IACUC, and IRB.

- Debra Dwyer, Senior Institutional Biosafety Committee Administrator, retired from Cornell University.
- Jessica Pecone, Ph.D., was appointed Institutional Biosafety Committee Administrator.

Projects:

- **BSL-3 Research Review committee.** Due to the significant growth of the BSL-3 and ABSL-3 research activities involving SARS-CoV-2, the previously small BSL-3 oversight and review program was put under significant strain in order to support these research activities. During the Fall of 2020 it was determined that a review of the BSL-3 and ABSL-3 research programs should be undertaken to fill gaps, improve communication, and increase collaboration across the multiple groups and stakeholders in this program. ORIA provided administrative support and regulatory expertise along with EHS-Biosafety, CARE, IACUC staff, and CVM administration to conduct an in-depth review of the program. The committee was formed by the Chief Research Compliance Officer, Mark Hurwitz Ph.D. and was chaired by David Putnam Ph.D., Associate Dean for Innovation and Entrepreneurship in the College of Engineering. The committee consisted of shareholders from CVM (BSL-3 facilities), CARE (Animal facilities), ORIA, EHS-Biosafety, and faculty representation. The committee completed a review of the program and a report was submitted to the Vice President for Research and Innovation, Emmanuel Giannelis Ph.D. and Dean Lorin Warnick DVM, Ph.D. of CVM. The ORIA IBC Staff in conjunction with EHS Biosafety are in the process of implementing the recommendations for the report which were to increase communication between CVM, ORIA, EHS Biosafety, CARE, the IACUC, and the IBC. The IBC staff (ORIA) and the IBC committee are in the process of drafting new procedures that will simplify the review process for BSL-3 and ABSL-3 applications while continuing to provide quality reviews. Additionally, the IBC will develop a procedure for reporting, reviewing, and addressing concerns voiced from the research community concerning research activities described within the IBC charge.

- **New software system for IBC application.** The ORIA leadership and IBC staff are currently evaluating new software systems to manage IBC applications. This new software program will replace the current eMUA system. The IBC staff has solicited feedback from the IBC members and has been collecting feedback from PIs to consider while evaluating the potential replacement systems. The current evaluation criteria include a system that is faster, has a more intuitive application, contains technology that assists with the review process, has tracked changes that are helpful, and has a central dashboard that will provide users, administrators, and reviewers with a clear picture of what actions are needed. A system that integrates IACUC and IBC applications is highly valued. ORIA leadership and IBC staff have evaluated three systems and hope to begin work on implementing a new system in the near future.

- **Updates to procedures and policies.** IBC staff have begun the process of systematically reviewing IBC policies, procedures, and guidance documents to make updates, simplify where possible, and align with EHS procedures to prevent duplication of procedures and guidance documents. Updates have been made to the guidance document for Reporting Incidents Involving r/sNA or other Biohazardous Materials. Additionally, the IBC voted to retire the older IBC Lentiviral vector guidance document in favor of using the EHS

Biological Agent Reference Sheet (BARS) for Lentiviral vectors. As the IBC is currently undergoing a routine internal audit by the Cornell Audit office, we expect that additional updates to procedures and new procedures will be needed to address gaps identified during the audit process.

6. *MUA (Project) review activities*

During the reporting year June 1, 2020 - June 30, 2021, the IBC held 12 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 or designee or the Biosafety Officer reviews, confirms the classification of projects that are exempt from the NIH guidelines, and approves the submission. Those are reported to the IBC at a subsequent meeting.

- **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 and are contingent upon the successful completion of annual reviews.

- **Review of Biosafety Level 3 (BSL3) Application:** BSL3 Applications are reviewed by the BSL3 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 for improving the application to the Principal Investigator (PI) 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 BSL3 work. This process is currently under review and changes are expected to be implemented within the next reporting period.

- **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 456 MUAs or continuation requests (amendments and annual questionnaires) were reviewed during the 2020-21 cycle. A breakdown of projects submitted for review during the same periods in 2018-2019 and 2019-2020 is below:

Classification	**Type**	**Number reviewed during 2018-2019**	**Number reviewed during 2019-2020**	**Number reviewed during 2020-2021**
Exempt	Section F	4	6	3
	Section F with Biohazards	5	3	6
Non-Exempt	Section D	6	15	2
	Section D with Biohazards	51	41	42
	Section E	9	16	11
	Section E with Biohazards	12	14	8
BSL3 Application		0	5	6
BSL3 Amendment		4	3	13
Biohazards only		20	16	17
Annual Reviews		140	138	169
Amendments		103	145	179
Total reviewed		354	402	456
MUAs Terminated		15	8	9

COVID-19 related information: In March 2020, owing to the heightened risk of COVID-19 transmission, the Provost and Vice President for Research and Innovation directed researchers to suspend non-essential laboratory and field research activities. During this time, the IBC continued to review and approve MUAs, annual reviews, and amendments so that approvals would be in place as researchers returned to work. In the summer of 2020 continuing throughout June of 2021, the IBC continued efforts to support the growing research portfolio for SARS-CoV-2, including both laboratory and animal studies. In conjunction with EHS, CARE, CVM, the IBC reviewed and approved 11 BSL3 applications to support research activities involving SARS-CoV-2. The IBC also maintained full operations during the previous year while continuously adapting to changing University policy and regulation with regards to the pandemic.

7. *Adverse Events*

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

1. The evening of August 30, 2020 a graduate student was working within a BSL2 research laboratory removing collagen I hydrogels from a spring apparatus system to process for PCR. To do this, a biopsy punch is used to cut the hydrogel out of a spring system, and then forceps are used to transfer the gel into 1mL centrifuge tubes in a biosafety cabinet. The tissue is then either flash frozen or digested in lysis buffer for RNA extraction. The cells in the hydrogel were primary porcine cells transduced with a replication deficient third generation lentiviral vector carrying human Notch1 intracellular domain (p LIX-hN1ICD, Addgene Plasmid #91897). During this process the biopsy punch is cleaned with ethanol between samples. The student was removing residual ethanol from the punch with a Kimwipe held in their hand. The graduate student was cut on the right index finger while cleaning the biopsy punch. This cell line had been created by a previous graduate student. These cells were transduced with the lentiviral vector, incubated for 24 hours. The medium was changed and cells were incubated an additional 48 hours. The previous graduate student selected for positive cells and froze the cells. The student who was injured expanded the cells from the frozen stock. Immediately after the injury, the graduate student cleaned the cut with soap and water at the lab sink and applied antibacterial ointment and a Band-Aid. The student reported to their supervisor. The supervisor and student reviewed the Cornell University Institutional Biosafety Committee document - Guidance on the Use of Lentiviral-Based Vectors. This document includes information on how to handle accidental exposures which include reporting to Cornell Environment, Health and Safety as well as seeking medical attention. The same evening, the student contacted Cornell Health, our on-campus medical center and the university Biosafety Officer (BSO). The student and biosafety officer reviewed the incident. The cell line had been passaged and the procedure of cleaning the punch likely lowered risk. Exposure risk and the oncogenic potential of the transgene were discussed with the student. The relevant institutional training completed by the student include Bloodborne Pathogen training and Laboratory Safety Training. The student was trained for this specific procedure by a previous graduate student over the course of one month from June-July 2020. Training included general handling and transduction of lentiviral cells. The student was performing this specific RNA isolation procedure independently for the first time. No in-person training was performed, although it was similar to a procedure the student was trained on. There was no apparent deviation from lab SOPs or institutional biosafety approval. Containment of materials was maintained at BSL2. Personal protective equipment and engineering controls used at the time include a lab coat, pants, closed toed shoes, face mask, and nitrile gloves. Work was performed in a Type II A2 biosafety cabinet. Face masks are currently required on Cornell's campus due to the COVID-19 pandemic. There were no apparent engineering control or PPE failures. The morning after this incident (approximately 14 hours) medical practitioners saw the student. The consultation resulted in prophylaxis with Truvada (Emtricitabine) and Isentress (Raltegravir). Beyond the cut received by the student, there is currently no additional reported illness. During the sampling process, the biopsy punch is cleaned with ethanol between samples. The student was injured while wiping the residual ethanol from the punch with a Kimwipe in their hand. The lab SOP has been modified so that the absorbent material remains on the work surface of the biosafety cabinet, rather than in the researcher's hand.

2. At approximately 1 pm on December 7, 2020, a postdoctoral researcher and graduate student were working in laboratory within the multi-room BSL-3 research suite. Both personnel were working with human macrophages infected with *Mycobacterium tuberculosis*, Erdman expressing mCherry. Work is performed in a 96-well optical bottom plates (15 ml. total volume) with black polystyrene upper structure. Typical of these plates, lids are loose-fitting. This arrangement allows researchers to image infected macrophages. While examining a plate outside primary containment, a lid came loose and a small amount of the culture medium containing Mycobacterium tuberculosis was spilled onto the postdoctoral researcher while the graduate student was approximately 2 feet away. The postdoctoral researcher placed the plate and lid onto an adjacent research bench. The graduate student observed spilled medium on the postdoctoral researcher's shoes, wrap-around gown, gloves, and scrub pants. A similar visual exam of the graduate student by the postdoctoral researcher did not reveal any visible droplets on their person. There was some visible liquid on the adjacent bench, sink, and floor around the postdoctoral researcher which was avoided during the following process. Immediately following this visual assessment:
    - The graduate student retrieved an autoclave bag for waste collection from a nearby cabinet, while the postdoctoral researcher remained in place.
    - The graduate student held the waste bag for postdoctoral researcher to doff outer gloves.
    - The graduate student supplied the postdoctoral researcher with a new set of outer gloves.
    - The postdoctoral researcher removed their contaminated Tyvek wrap-around lab coat and placed it in the waste bag.
    - The postdoctoral researcher doffed outer and inner gloves and placed them in the waste bag.
    - The postdoctoral researcher donned new gloves.
    - The postdoctoral researcher doffed scrubs, hairnet, socks, foam clogs, exiting the laboratory wearing underclothes, a half-face elastomeric respirator, and gloves.
    - Gloves were removed before exiting the containment boundary of the suite and entering the research suite's anteroom/changing area.
    - The postdoctoral researcher immediately proceeded to the shower while wearing their respirator. The postdoctoral researcher showered with soap and water, washing their hair for 10-15 minutes. While showering, the respirator was washed, then removed so the postdoctoral researcher could wash their face.
    - The shower was taken while wearing undergarments. The undergarments were removed after soaping, during the shower. Undergarments were collected for processing.

- While the postdoctoral researcher was doffing and proceeding to the shower, the graduate student placed a call to the College of Veterinary Medicine Biosafety Engineer to notify them of the incident. The Biosafety Engineer notified the University Biosafety Officer via phone. The Biosafety Engineer and Biosafety Specialist from the College of Veterinary Medicine (spill team) responded to the Research and Diagnostic Annex BSL-3, arriving at approximately 1:15 pm.
- After completing the phone call the graduate student similarly doffed their PPE to exit the laboratory:
    - The graduate student removed their outer gloves and placed in the biohazard bag.
    - The graduate student doffed their Tyvek wrap-around lab coat, and hairnet and placed them in the waste bag.

- The graduate student removed safety glasses, scrubs, socks, foam clogs, exiting the laboratory wearing underclothes, N95 respirator, and 'inner' gloves.
- Gloves and N95 respirator were removed and disposed of before exiting the containment boundary of the suite and entering the research suite's anteroom/changing area.
- After the postdoctoral researcher completed showering, the graduate student showered for 10-15 minutes with soap and water. The shower was taken while wearing undergarments. The undergarments were removed after soaping, during the shower. Undergarments were collected for processing.

❖ RESPONSE

- Immediately after the spill, and after research personnel had completed showering, the spill team interviewed the research personnel to determine the location of the spill, the nature of the spilled material, and the associated circumstances. At approximately 1:45 pm the spill team started spill response moving from the anteroom area, through the entry to the containment zone, a common corridor, and laboratory using a pump sprayer and CiDecon phenolic disinfectant to treat the floor along the entire path:
- Arriving at the lab, the spill team surveyed the lab and saw the pile of PPE (2 gowns, 2 pairs of scrub tops and pants, socks, and shoes along with safety glasses) on the floor of the room, next to a partially-filled red bag a few feet inside the door in the location they reported the spill had occurred. Three 96-well plates were on the adjacent research bench.
- While entering, the floor and pile of PPE was liberally sprayed with CiDecon. The vertical casework, benchtop, nearby freezer, incubator, laboratory stool, and remaining plates were sprayed during this process.
    - A large inverted autoclavable biohazard bag was used to collect the PPE and bag on the floor which held the doffed gloves, hairnets, and Tyvek. That bag was double-bagged, moved to a corridor by the spill team. The floor where the PPE pile had been was sprayed with CiDecon.
    - Inverted "Ziploc" bags were used to collect the three plates; after closing the bags the plates were placed in a new autoclavable biohazard bag with paper towels and other waste generated during the cleanup.
    - At this point, the total amount of contact time for the floor and surfaces sprayed was over 20 minutes. Clean water and a mop were used to remove the CiDecon from floor surfaces while paper towels were used to wipe down casework, the incubator, and the freezer. These surfaces and the phone were sprayed with PreEmpt, an accelerated hydrogen peroxide disinfectant. The second round of CiDecon was sprayed on the lab, common corridor, and anteroom flooring.
    - This second application of CiDecon was allowed 10 minutes of residence time and mopped with clean water.
    - All waste was collected in autoclavable biohazard bags and autoclaved using standard facility procedures.
    - The spill team doffed their PPE, placing it in autoclavable bags for later disposal. Respirators worn by the spill team were sprayed with PreEmpt.
    - The spill team collected the researcher's undergarments for laundry with the facility scrubs.

- TRAINING
  - Cornell's training for BSL-3 researchers includes bloodborne pathogen training, laboratory safety training, classroom BSL-3 training, in-facility BSL-3 training, and mentor-apprentice training.
    - The postdoctoral researcher completed their training during the summer of 2019.
    - The graduate student completed their training during the summer of 2017.
    - Both personnel completed the recent annual refresher BSL-3 class in November 2020.
- PPE
  - Personal protective equipment and clothing for researchers in the Research and Diagnostic Annex include: facility-provided scrubs, socks, foam clogs, hairnet, wrap-around impervious (Tyvek) gown, double gloves and respiratory protection. Due to some PPE shortages caused by the COVID-19 pandemic, respiratory protection for some users is an elastomeric respirator with appropriate cartridges while others are using disposable N95 respirators.
- OCCUPATIONAL HEALTH REQUIREMENTS and MEDICAL
  - All researchers in Cornell's tuberculosis research program receive regular tuberculosis testing by either PPD or blood tests. Due to the potential risk of exposure to the postdoctoral researcher and graduate student both were able to contact medical providers the day of the incident and blood tests (QuantiFERON) were administered the following day (December 8). This test was administered as a 'baseline' test since it had been several months since the last test for either researcher. Both researchers will self-monitor for symptoms of TB and be retested in several weeks, per advice from a medical professional. There is currently no additional reported illness. The university biosafety office will continue to follow up with the researchers.
- MEASURES TAKEN TO MITIGATE IDENTIFIED PROBLEMS
  - The Principal Investigator has reviewed the procedure with the researchers, emphasizing that plates are not to be observed in the manner the plates were and containment of plates is to be maintained.
  - The Principal Investigator, researchers, spill team, and Biosafety Officer have reviewed the incident and incident response. During the response to the spill, researchers decided to disrobe within the lab, rather than exit the lab and disrobe at the door to the lab, before exiting the facility. Though this doesn't create a new hazard, it does prolong the time researchers spend in a laboratory with a spill.

8. *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.

The committee was updated on:

- The FOIA process and regulatory requirements involved with the release of IBC meeting minutes upon request were reviewed with the IBC members. Under the NIH guidelines IV-B-2-b, meeting minutes must be made available to the public upon request. The IBC members were updated on the process involving redaction of the minutes, review and coordination with University Counsel and University Public Relations, and release of the

documents. This review occurred due to two FOIA requests for IBC documents received in the past year.

- The committee was updated on the University's evolving response to the COVID-19 pandemic, campus health and safety procedures, and the effects on the research process by EHS Biosafety periodically at convened meetings throughout the year.
- The committee was updated on and discussed acceptable methods for inactivation of Risk Group 3 organisms specifically related to the inactivation of SARS-CoV-2 to be used in other research applications.
- The committee was also updated on safety practices involving the use of lentiviral vectors and has adopted the EHS Biosafety guidance on Lentiviral vectors and retired outdated guidance documents.
- Education of newer IBC members continued by combined efforts from IBC staff and EHS Biosafety to provide requested training and guidance documents for various biosafety and containment practices of interest to members. These included documentation on the difference between BL2-P and BL1-P containment and information concerning Adeno-associated viral vectors.

Appendices found below

9. *Appendix A: Current Committee Membership*

Voting Members

Colin Parrish Ph.D. (Chair)	Professor, James A Baker Institute for Animal Health, Microbiology & Immunology
Sara Carpenter	Research Support Specialist, Plant Pathology & Plant-Microbe Biology Section
Anthony Hay Ph.D.	Assoc. Professor, Microbiology
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

Ex-Officio, Voting Members

Joshua Turse Ph.D.	Biological Safety Officer, Environment, Health and Safety
Paul Jennette MS	Biosafety Engineer, CVM Biosafety Program
John Clarke MD	Occupational Medicine, Cornell Health Services
Bhupinder Singh DVM	Veterinarian, CARE

Ex-Officio, Alternate Voting Members

Stephanie Mattoon MPH	Biosafety Specialist, Environment, Health and Safety
Bryant Blank DVM	Clinical Veterinarian, CARE
Ed Koppel MD	Occupational Medicine, Cornell Health Services
Hannah Glaspell MPH	Biosafety Specialist, Environment, Health and Safety

Ex-Officio, Non-Voting Members

Rhoda Maurer MS	Manager, Tower Road Greenhouses, CALS
Emmanuel Giannelis Ph.D.	Vice President for Research and Innovation - Institutional Official
Charles Van Loan Ph.D.	Dean of Faculty
Christine Bellezza DVM	Director of Research Assurance

Administrative Support Staff

Michael Betteken Ph.D.	IBC Administrator
Jessica Pecone Ph.D.	IBC Administrator
Kelsy Earl	IACUC/IBC Compliance Assistant

10. *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.

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

AGRICULTURE & LIFE SCIENCES	**104**
Animal Science	7
Biological and Environmental Engineering	6
Biological Statistics & Computational Biology	2
Crop and Soil Sciences	1
Ecology and Evolutionary Biology	5
Entomology	3
Food Science	10
Horticulture	1
Microbiology	9
Molecular Biology and Genetics	14
Neurobiology & Behavior	4
Nutritional Sciences AG	5
Plant Biology	15
Plant Breeding	5
Plant Breeding	1
Plant Pathology	16
ARTS AND SCIENCES	**44**
Chemistry And Chemical Biology	12
Ecology And Evolutionary Biology	2
Molecular Biology and Genetics	16
Neurobiology & Behavior	7
Physics	2
Plant Biology	1
Psychology	4
BOYCE THOMPSON INSTITUTE	**10**
Boyce Thompson Institute	10
ENGINEERING	**41**
Applied & Engr Physics	6
Biomedical Engineering	19
Chemical and Biomolecular Engineering	6
Civil & Environmental Engineering	3
Materials Science & Engineering	2
Mechanical & Aerospace Engineering	5
GENEVA	**12**
Entomology-Geneva	2
Horticultural Sciences-Geneva	5
Plant Pathology-Geneva	5
HUMAN ECOLOGY	**12**

Human Ecology Administration	2
Nutritional Sciences	10
RESEARCH-CENTERS	**5**
Weill Institute for Cell and Molecular Biology	5
VETERINARY MEDICINE	**92**
Baker Institute for Animal Health	9
Biomedical Sciences	14
Clinical Sciences	14
Microbiology & Immunology	19
Molecular Medicine	13
Population Medicine & Diagnostic Sciences	21
Quality Milk Production Services	1
Vet Administration	1
VP/RESEARCH	**3**
Institute for Biotechnology & Life Science Technology (E)	2
Vice President for Research and Innovation	1
Grand Total	**323**

12. *Appendix D: Lab Facility Information*

The categories and numbers of laboratories (rooms) known to be conducting research at Biosafety levels BL1, BL2, or BL3, as of June 30, 2021, are as follows. This information is provided on the MUAs by researchers:

- 353 laboratories operating at BL1
- 473 laboratories operating at BL2
- 155 BL2-P level greenhouses/growth chambers
- 37 BL1-N animal care rooms
- 37 BL2-N animal care rooms
- 11 laboratories operating at BSL3
- 1 facility operating at BL3-N.