INSTITUTIONAL BIOSAFETY COMMITTEE
12:02 p.m.
President's Conference Room
Meeting Minutes
February 11, 2026

Members Present:
Jovanka Voyich-Kane, Microbiology & Cell Biology, chair
Amy Robison, Biosafety Officer
Alyssa Evans, Microbiology & Cell Biology
Jerod Skyberg, Microbiology & Cell Biology
Kristen Connolly, Center for Biofilm Engineering
Matt Taylor, Microbiology & Cell Biology, IACUC Chair
Kim Hilmer, Chemistry/Biochemistry
Mike Giroux, Plant Sciences & Plant Pathology
Blake Wiedenheft, Microbiology & Cell Biology
Jennifer DuBois, Chemistry/Biochemistry
Katie Rowse, Community Member

Members Absent:
Dale Huls, Office of Sponsored Programs
Josh Charles, Bozeman Fire Department, Community Member

Ex-Officio Members Present:
Tammy Lynn, Safety & Risk Management
Jaspur Kolar, Bridger Occupational Health & Urgent Care
Kirk Lubick, Research Integrity & Compliance
Nicole Soll, Research Integrity & Compliance

Ex-Officio Members Absent:
None

Guests:
Mark DeWald, Research Integrity & Compliance
Ryan Brickman, Safety & Risk Management

I. Review and approval of IBC Meeting Minutes from January 11, 2026.

The minutes were approved as written. Approved 9, Nays 0, Abstained 0

II. Announcements from the Chair:

Jerod Skyberg will be leaving IBC in July to join IACUC

III. Protocols/Amendments/Renewals/Interim Reviews Approved since September Meeting:

Protocol #	Reference #	Principal Investigator	Title	Protocol Type...	Expiration Date	Renewal Date
2023-466-IBC	466	Deluca, Steve	Investigation of gene regulation during ani...	Amendment	6/30/2026	6/30/2026
2024-50-IBC	50	Flenniken, Michelle	Flenniken Lab Virology and Immunology	Amendment	4/30/2027	4/30/2027
2024-52-IBC	52	Walk, Seth	Ecology of the Mammalian Microbiome	Amendment	9/30/2027	9/30/2027
2024-62-IBC	62	Broderick, Joan	Iron-Sulfur Clusters in Biological Radical Gen...	Amendment	8/31/2027	8/31/2027
2026-8-IBC	8	Giroux, Michael	CRISPR knockouts and gene insertions affec...	Amendment	2/28/2029	2/28/2029
2026-99-IBC	99	Miles, Mary	Nutrition Research Laboratory Exposure Con...	Amendment	1/31/2029	1/31/2029
2025-555-IBC	555	Heveran, Chelsea	Biomineralization studies using microorgani...	Interim Review	2/28/2028	2/28/2028
2026-121-IBC	121	Lu, Chaofu	System Biology to Improve Oilseed Traits	Renewal	2/28/2029	2/28/2029
2026-14-IBC	14	Merzdorf, Christa	The role of Zic1 and of its direct targets, suc...	Renewal	1/31/2029	1/31/2029
2026-429-IBC	429	Lemon, Christopher	Developing Designer Proteins with Novel Fu...	Renewal	2/28/2029	2/28/2029

Amendments

2023-466: personnel update

2024-50: personnel update

2024-52: received clinical isolates for routine genotypic and genomic characterization

Biohazardous Agents: Clostridium difficile

Strains: clinical isolates **Biosafety Level:** 2

2024-62: personnel updated

2026-8: added University of Wisconsin info and updated Agrobacterium

Recombinant/Synthetic Nucleic Acid Molecules:

Host: Agrobacterium **Vector/Plasmid:** JD633

Inserted Nucleic Acids/Genes of Interest: auxin gene **Biosafety Level:** 1

NIH Guidelines: Section III-E

2026-99: updated personnel

New Business

A. Review of Protocols

Amendments

32 Lachowiec "Genome editing and trangenesis in plants"

Overview: This research will develop a new genetic engineering method to create novel mutations in targeted locations in a plant genome. New objectives include: We seek to create CRISPR knockouts to study stress responses and development in wheat. For this project we designed vectors to create knockout mutations in Triticum aestivum. We are collaborating with UC Davis to create the edited events and generate transgenic plants.

Risk mitigation includes: Plants will be grown to maturity in locked and controlled greenhouses; floor drains in the greenhouse will be covered during harvest to prevent loss of seeds; and will follow all transgenic plant protocol methods. No plants will be released to the environment. All transgenic seeds are stored in a metal, key-locked cabinet.

Recombinant/Synthetic Nucleic Acid Molecules:

Host: Wheat via E.coli and Agro **Vector/Plasmid:** JD633

Inserted Nucleic Acids/Genes of Interest: Cas9 driven by Maize ubiquitin promoter
gRNAs against SWEET1 or TB1 are driven by the wheat U6 RNA Polymerase III promoter
Overexpression cassette containing a chimera of Growth-Regulating Factor 4 (GRF4) and GRF-Interacting Factor 1 (GIF1) (GRF4-GIF1) driven by the Maize ubiquitin promoter. This improves wheat regeneration and transformation efficiency in vitro.
Ubiquitin promoter in Panicum virgatum used to drive the expression of the hygromycin phosphotransferase (hpt) gene for Hygromycin selection. **Biosafety Level:** 1

NIH Guidelines: III-D

Motion to approve
Approved 11, Nays 0, Abstained 0

350 Lauchnor "Analysis of wastewater samples"

Overview: Perform analysis on water samples to aid in the design and operation of wetland systems used to improve water quality. Some of our environmental samples are obtained from systems that have a low risk of containing human pathogens like wetlands designed for nutrient removal from stream waters or isolated greenhouse experiments receiving highly controlled nutrient solutions. New objectives include: determining whether their pilot treatment system at Bridger Bowl remediates viruses. Abiotic synthetic wastewater and treatment system wastewater will be spiked with a commercially available modified live vaccine as a process control to understand the amount of virus lost in downstream processing and extraction in order to estimate the amount of virus present in the initial sample. RNA will be extracted to quantify virus levels using qPCR.

Risk mitigation includes: A lab member will wear PPE to collect the sample and transport it following MSU policy. The sample will be pasteurized prior to spiking. The vaccine will be reconstituted and handled in the BSC. There is no use of needles or sharps. Cultivation and isolation/enrichment of bacteria or viruses from wastewater samples is not conducted as part of this project. All waste generated will be autoclaved (solids and small volumes), bleached (liquid waste), or sprayed with

ethanol (reusable solids).

Biohazardous Agents: bovine rotavirus, bovine coronavirus
Strains: modified live virus **Biosafety Level:** 2

Motion to return for modification and DMR upon submission
Approved 10, Nays 0, Abstained 0
Approved items to be addressed include:

Amendment Information:

- Remove: “indicating that our lab may work with viruses and linking protocol from Dr. Emma Loveday on virus inactivation." and replace with "updated protocol objectives”.

Principal Investigator:

- PI must complete the Occupational Health and Medical Surveillance forms

Protocol Objectives:

- How will successful removal of viruses from the Bridger Bowl wastewater be determined when only treated water is being collected? (*Will there be samples taken prior to the treatment at the wastewater site in addition to the end effluent?)*
- The committee would like you to test the internal temperature of a mock sample to verify the thermal dynamics equation works under the parameters used in the lab.
- 5th paragraph in new section: it is unclear if both the inactivated sample and the synthetic wastewater will be spiked. If accurate add "synthetic wastewater and" to the 2nd sentence

Related Research Request(s):

- Check "no" now that spiking with inactivated SARS-CoV-2 has been removed from the protocol objectives, IBC protocol 377 does not need to be linked anymore.

Protocol Associates:

- Several protocol associates need to complete the Occupational Health and Medical Surveillance forms

Originals
593 Walk “Collection and processing of urine and stool samples from bison without animal handling”
Overview: Stool and urine samples will be collected from bison overwintering in thermally active areas of the YNP known to have high levels of arsenic and other heavy metals and identify important microorganisms that help detoxify metals in their diet. DNA will be extracted and heavy metals (ICP-MS) will be quantified from thawed frozen stocks.
Risk mitigation includes: All samples will be treated as potential biohazards and BSL2 precautions will be used through collection and processing. All materials in contact with the samples will be decontaminated in a 10% bleach solution before being placed in a biohazard waste container. MSU lab personnel will wear dedicated clothing described in the PPE section, and put on disposable gloves to collect samples in screw-cap centrifuge tubes (primary containment), surface disinfected with 10% bleach, and placed on ice. Gloves will be removed and placed in a biohazard bag (or sealed plastic bag) to be transported back to the lab for disposal in the biohazard waste. Personnel will leave the area if they come upon aborted bison materials and will report potential exposure.

Biohazardous Agents: none
Recombinant/Synthetic Nucleic Acid Molecules: none

Motion to return for modification and DMR upon submission.
Approved 10, Nays 0, Abstained 0
Approved items to be addressed include:

Protocol Objectives:

- Attach any applicable permits here.

- Suggest adding language that personnel will leave the area if they come upon aborted bison materials and will report potential exposure.
- If any filtering of urine is necessary, please add these details to objectives.
- 1st paragraph; 3rd sentence - remove "environment (e.g., snow)" and replace with "surface of the snow".

Protocol Associates:

- Confirmation of completion of Occupational Health and Medical Surveillance forms pending spreadsheet update.

Disinfection Procedures

- Change contact time to 30 minutes if decontaminating waste with bleach.

Renewals

10 Kunze "Neuronal cell cultures for Brain-on-chip models to study communication and neurodegeneration."

Overview: This protocol comprises the establishment of neural cell-based models mimicking neurodegenerative diseases and events in vitro to study the role of mechanical and chemical signals on disease propagation, and to determine the role of nanomagnetic forces in cell functioning and the propagation of degenerative events based on stress markers, protein phosphorylation, calcium signaling, and extracellular vesicle profiling. Primary neurons are generated from commercially available rat brain tissue. Toxins and calcium channel blockers are used in conjunction with nanoparticles. Biochemical and mechanical interference with intracellular compartments in neurons will be monitored using fluorescent labeling techniques.

Risk mitigation includes: Experiments are performed in a B2 BSC in closed Petri dishes following the toxin-appropriate handling procedures (per SDS). Neural cultures will be fixed with 4% paraformaldehyde before imaging, or unfixed samples will be transported for imaging following MSU policy. Materials containing toxins or channel blockers will be decontaminated and inactivated through chemical exposure, dry heat, or autoclaved, and handled afterwards as chemical waste.

Biohazardous Agents: BacMam(modified baculovirus)
Strains: Autographa californica, AcMNPV, polyhedron minus strain **Biosafety Level:** 1
Biohazardous Agents: modified adeno-associated virus (AAV)
Strains: Green & Blue, fluorescent protein, Aequorea victoria, promoter from cytomegalovirus
Biosafety Level: 1

Recombinant/Synthetic Nucleic Acid Molecules:
Host: rat tissues/cells **Vector/Plasmid:** modified baculovirus (BacMam)
Inserted Nucleic Acids/Genes of Interest: Tubulin-EmGFP or TagRFP **Biosafety Level:** 1
Host: rat tissues/cells **Vector/Plasmid:** modified baculovirus (BacMam)
Inserted Nucleic Acids/Genes of Interest: hTau40-mCherry **Biosafety Level:** 1
Host: rat tissues/cells **Vector/Plasmid:** modified baculovirus (BacMam)
Inserted Nucleic Acids/Genes of Interest: GECO-G **Biosafety Level:** 1
Host: rat tissues/cells **Vector/Plasmid:** modified baculovirus (BacMam)
Inserted Nucleic Acids/Genes of Interest: beta actin-GFP **Biosafety Level:** 1
Host: rat tissues/cells **Vector/Plasmid:** modified adeno-associated virus (AAV)
Inserted Nucleic Acids/Genes of Interest: GFP / BFP **Biosafety Level:** 1

NIH Guidelines: Section III-F

Motion to return for modification and DMR upon submission
Approved 10, Nays 0, Abstained 0
Approved items to be addressed include:
Protocols Objectives:

- Update toxin information as follows:
    - remove first paragraph for Okadaic acid and Conotoxin. *Add this info to the lab specific biosafety manual under Exposure Risks.*
    - keep general information on how they are handled and destroyed
- Calcium channel blocker kit section
    - remove "The kit comprised the following chemicals:" line
    - remove sections 1-5. *Add this info to the lab specific biosafety manual under Exposure Risks.*
    - keep info on how it is used, stored and destroyed
- Ensure SDS for each toxin and chemical is incorporated in the lab specific biosafety manual

Protocol Associates:
- Select a co-I as it is required

Funding Source(s)
- If funding with Stephanie McCalla is still valid, add Stephanie McCalla in protocol associate section or remove Stephanie McCalla in Row 3 if Anja Kunze is also named as PI on funding

Laboratory Biosafety Manual
- Per instructions in section 2.9 update lab manual and attach

BSC Details
- update if applicable

Date of Lab Self-Inspection
- Please update with most current lab self-inspection date (within last 365 days).

149 Pincus "Immune Response to Virus Proteins"
Overview: The studies proposed here aim to express the full-length Spike (S) protein of SARS-CoV-2 and/or the Envelope protein of HIV-1 in various antigenic forms: inactivated virus lysate, pseudoviruses, recombinant protein, tryptic digest, and expressed on the surface of transfected cells. We will then study the human antibody response using these antigens, and correlating the results with neutralization ability and/or immunotoxin activity. We will analyze the antibody response by flow cytometry and cryoEM. Once relevant antigens are identified, they will be purified in larger quantity for structural analyses. Human cell lines, serum, PBMCs, and/or plasma will be used in these studies. Genes encoding Spike or Envelope will be obtained from BEI, academic collaborators, or synthesized, and expressed in CHO, HEK293, or HeLa cells or their derivatives. Plasmids will be grown in E.coli K12 prior to transfection.
Risk mitigation includes: Serum/plasma are decontaminated with 1% Triton X-100 immediately at time of opening, if they have not previously been decontaminated prior to shipment. No new samples will be collected, however we will continue to use the extant samples in ongoing experiments. Work is done in a BSC. Liquid laboratory waste will be disinfected using 5% Microchem disinfectant for >24hr. Solid laboratory waste containing potentially biohazardous materials will be autoclaved prior to disposal. Laboratory surfaces and small equipment will be disinfected daily by wiping them down with a 70% Ethanol solution.

Biohazardous Agents: Escherichia coli cloning
Strains: K12 **Biosafety Level:** 1
Biohazardous Agents: Pseudotyped lentivirus
Strains: Non replicative virions that express a reporter gene when they "infect" a cell by using the virus receptor-binding protein that is incorporated into the pseudovirion. **Biosafety Level:** 2
Biohazardous Agents: Pseudotyped VSV
Strains: Nonreplicative virus particles that express the Spike or Envelope protein in a native conformation. **Biosafety Level:** 2

Recombinant/Synthetic Nucleic Acid Molecules:

Host: CHO, HEK, HeLA cells and derivatives; E. coli
Vector/Plasmid: pcDNA3.1, pUc, other eukaryotic expression vectors derivative
Inserted Nucleic Acids/Genes of Interest: Encode SARS-CoV-2 spike protein or HIV envelope protein, components of lentivirus and VSV pseudovirions **Biosafety Level:** 1
Host: Jurkat cells **Vector/Plasmid:** no vector cells only
Inserted Nucleic Acids/Genes of Interest: CD16, CD89,fluorescent protein reporters
Biosafety Level: 2
NIH Guidelines: III-D

Motion to return for modification and DMR upon submission
Approved 10, Nays 0, Abstained 0
Approved items to be addressed include:

Protocols Objectives:

- change "disinfected" to "inactivated" in 1st sentence
- amend "and more recently from colleagues working in the MSU BSL3 lab" to "and from colleagues at MSU".
- ensure that you have a Certificate of Inactivation for SARS-CoV-1 inactivated materials. This certificate must remain with sample.

Related Research Requests:

- Check "yes" and select Dr. Loveday's IBC protocol 377 as this is now the source of inactivated SARS CoV-2.

Protocol Associates:

- Select a co-I as it is required
- OSHA BBP Training due for Valerie Copie
- Occupational Health due for Valerie Copie and Emma Cummings

Human/Non-Human Primate Material:

- In rows 5 and 6 replace "disinfected" with "inactivated".
- In row 5, inactivated SARS-CoV requires a Certificate on Inactivation per select agent regulations. Ensure you have this and it remains with the samples.

444 Evans “Characterizing the viral and immune factors that mediate arbovirus neuropathogenesis”
Overview: This research is to elucidate the molecular mechanisms, viral genetics, and host responses that mediate neuropathogenesis of neuroinvasive arboviruses. We primarily use members of the California serogroup (CSG) of orthobunyaviruses that have differing neuropathogenic phenotypes, including La Crosse virus (LACV), Jamestown Canyon virus (JCV) and Inkoo virus (INKV). In addition, we will utilize West Nile virus and Sindbis virus as representative viruses to compare mechanisms of neuropathogenesis across neuroinvasive arbovirus genera.. Recombinant viruses are created by modifying the cDNA plasmids that make up the reverse genetics system. Recombinant reverse genetics system plasmids containing fluorescent or bioluminescent tags will be generated to make fluorescent CSG viruses. Viruses, including the CSG reassortant and recombinant viruses, will be evaluated in mouse models. Cells, tissues, and organoids may be analyzed in a number of ways, including replication kinetics assays, cell viability assays, flow cytometry, RNA analysis, sequencing, immunohistochemistry, western blots, and plaque assays.
Risk mitigation includes: All work with infectious virus will be performed in a biosafety cabinet with BSL2 or ABSL2 level appropriate PPE and practices. No arthropod vectors will be used for this work. Infected mouse tissues will be used in end-point procedures only and will not be further propagated. All downstream analyses will utilize inactivated virus and/or fixed cells, tissues, or organoids for analysis. Cell viability assays on cell lines and organoids that do not inactivate the virus will be read in an approved BSL2 plate reader in appropriately covered and sealed plates. Any use of viruses or infected material in centrifuges or bead mills will be performed in gasketed tubes. All surface decontamination will be done with 10% bleach and/or 70% EtOH, all liquid waste decontamination done with a final concentration of 10% bleach, and all solid waste will be autoclaved using a certified autoclave.

Biohazardous Agents: Escherichia coli cloning
Strains: DH5a **Biosafety Level:** 1

Biohazardous Agents: Escherichia coli cloning
Strains: Stbl3 **Biosafety Level:** 1

Recombinant/Synthetic Nucleic Acid Molecules:
Host: Subcloning E. coli DH5a or Stbl3 **Vector/Plasmid:** pUC origin cloning vector
Inserted Nucleic Acids/Genes of Interest: orthobunyavirus sequences **Biosafety Level:** 1
Host: BHK-T7 and Vero cells **Vector/Plasmid:** pMK origin cloning vector
Inserted Nucleic Acids/Genes of Interest: full-length and recombinant L, M and S genome segments from LACV, INKV, and/or JCV. Recombinants include genes swapped between viruses, IRES insertions, and nano-luciferase and fluorescent protein insertions. **Biosafety Level:** 1
Host: Subcloning E. coli Stbl3 **Vector/Plasmid:** pMK origin cloning vector
Inserted Nucleic Acids/Genes of Interest: Full-length and recombinant genome segments and genes from LACV, INKV, or JCV. In some cases the plasmid will include the introduction of an IRES, nanoluciferase protein, or a fluorescent tag like RFP or GFP. **Biosafety Level:** 1
Host: Subcloning E coli DH5a or Stbl3 **Vector/Plasmid:** pcDNA3 RLUC POLIRES FLUC
Inserted Nucleic Acids/Genes of Interest: n/a. Used as template for the poliovirus IRES **Biosafety Level:** 1
Host: Subcloning E coli DH5a or Stbl3 **Vector/Plasmid:** pcDNA with miRFP670nano
Inserted Nucleic Acids/Genes of Interest: n/a. Used as template for miRFP670nano gene **Biosafety Level:** 1
Host: Subcloning E. coli DH5a or Stbl3 **Vector/Plasmid:** pUC and/or pMK pLACV-L, pLACV-M, pLACV-S, pINKV-L, pINKV-M, pINKV-S, pJCV-L, pJCV-M, pJCV-S and their recombinants
Inserted Nucleic Acids/Genes of Interest: full-length and recombinant L, M and S genome segments from LACV, INKV, and/or JCV. Recombinants include genes swapped between viruses, IRES insertions, and nano-luciferase and fluorescent protein insertions. **Biosafety Level:** 1

NIH Guidelines: III-D

Motion to approve
Approved 9, Nays 0, Abstained 1

445 Pratte "The probiotic potential of symbiotic partnerships: Can contact between aquatic animals enhance the anti-pathogen potential of protective microbiomes?"
Overview: We will determine the extent to which anemone skin-associated bacteria and mucus stimulate or inhibit the growth of clownfish skin-associated bacterial isolates and the known pathogens, Vibrio coralliilyticus and Vibrio alginolyticus; if physical contact between clownfish and anemones induces compositional shifts in the partners' microbiomes; andwill use pathogen challenge experiments to test if association with an anemone reduces clownfish susceptibility to a known cutaneous pathogen and vice versa. Mucus swabs will be collected from both species, and growth and inhibition of the species-specific pathogens will be analyzed by inhibition assays and extracted DNA for sequencing.
Risk mitigation includes: All work with open bacterial cultures will be conducted in the BSC. Bacterial cultures will be decontaminated with 10% bleach. Following inoculation, inoculation bath water and tank water will be decontaminated per ARC SOPs.

Biohazardous Agents: Vibrio alginolyticus
Strains: XII-53 [P. Baumann 118] **Biosafety Level:** 1
Biohazardous Agents: Vibrio coralliilyticus
Strains: YB [LB1, LMG 20984] **Biosafety Level:** 1

Recombinant/Synthetic Nucleic Acid Molecules: none

Motion to return for modification and BSO verification
Approved 10, Nays 0, Abstained 0
Approved items to be addressed include:
Biological Materials:

- Amend last column of this chart since you will be using bleach and not hydrogen peroxide.

Laboratory Biosafety Manual

- Lab specific biosafety manual should be updated for 2026 and should include signatures of all personnel on this protocol

Biological Safety Cabinets (BSC)

- The protocol objectives state that work is done in the BSC- check yes and add details to the table

Interim Reviews

None

B. Biosafety Officer Updates
    - BSO gave update from Greenhouse walkthrough

The meeting was adjourned at 1:20 p.m.