INL Institutional Biosafety Committee Annual Meeting Agenda & Minutes

November 19, 2024, 4:00 pm

Agenda

Open IBC 2024 Annual Meeting
Review 2023 minutes & vote for approval
Karin Adams – BSO – INL Strain Inventory (Risk Assessment)
Jeremy Sabo – Microbiology for seaweed, recycling, and critical materials
David Reed – IBC Chair Training – NIH Key Updates
Adjourn IBC Annual Meeting until 2025

INL IBC Committee Members

David Reed, Chair-Microbiology david.reed@inl.gov
Karin Adams, Biological Safety Officer karin.adams@inl.gov
Keri Martin, Human Health keri.martin@inl.gov
Jeffrey Lacey, Plant Biology jeffery.lacey@inl.gov
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Gabriella Morales, Environmental Engineering gabriella.morales@inl.gov
Gregg Losinski, Wildlife Gregg.Losinski@inl.gov

INL IBC Supporting Staff

Troy Bodily, Occupational Safety & Health IH troy.bodily@inl.gov
Sandra Fox, Biolaboratory Manager sandra.fox@inl.gov
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2023 Meeting Minutes

18 people attended the 2023 meeting including the following committee members:

- Gregg M. Losinski
- Gabriella C. Morales
- Karin L. Adams
- David W. Reed
- Linda S McCoy
- Sandra L. Fox (Energy and Environment Science & Technology Lab Manager)
- Troy O. Bodily (Industrial Hygiene Occupational Safety & Health Lead)

I. Karin Adams gave an update about new NIH guidelines under consideration for gene drive modified organism (GDMO).
II. INL scientist Asef Redwan, spoke about his research to better understand the regulation of microbial interaction in rare earth elements reduction. Rare earth elements are important metals in green energy, transportation, and communication.
III. David Reed presented his research about biological recovery of minerals from end-of-life or recyclable materials such as lithium-ion batteries important for electric vehicle technology.
IV. David Reed (IBC Chair) conducted training about the Public Health Security and Bioterrorism Preparedness and Response Act of 2002 and the importance of the IBC being vigilant of their responsibilities to protect the public and environment from hazards associated with research of hazardous microorganisms.

2024 Meeting Minutes

Meeting was brought to order by David Reed at 4:01 pm. The 2024 agenda and the 2023 minutes were reviewed. David Reed moved the motion to accept the 2023 minutes and Karin Adams seconded the motion. Committee members voted unanimously. Of the committee members, only Linda McCoy was unable to attend.

Attendance (23 people were present and all were INL employees except the two outside committee members)

David Reed	Troy Bodily	Miranda Kuns
Karin Adams	Sandy Fox	Payton Walker
Keri Martin	Caitlin Barboza	Rachel Colby
Jeffrey Lacey	Jeremy Sabo	Becca Brown
Troy Nelson	Jesse Carrie	Rey Keyfauver
Gary Billman	Ling Ding	Bill Smith
Gabriella Morales	Lynne Coe-Leavitt	Yoshiko Fujita
Gregg Losinski	Shelly Walton	

BSO Karin Adams discussed how the LWP-14621 controls how we make risk assessment for biological hazards. The LWP at INL developed based on NIH, CDC, WHO, USDA, APHIS to be DOE-Idaho compliant. For making an assessment, the principal researcher makes an initial assessment then discuss conclusions with the biological safety officer. Anytime there are risk group (RG) 2 organisms or higher involved in research the BSO they may/likely will work with the IBC and subject matter expert in assessing the hazards. They must evaluate operations, procedures, and facilities for potential hazards. Yearly the BSO must perform annual hazard assessments for INL they need to know what organisms are used in the labs and if they are RG2. One challenge that the BSO faces knowing what organisms are being used? A discussion ensued to discuss this. Yoshiko Fujita asked how we would handle assessing a mixed microbial community, especially one where the community member have not been determined (i.e., by DNA sequencing) and especially one where the community is in constant flux. Bill Smith suggested that perhaps for assessing potential RG2 microbes from the environment that one could consider media components used for enrichment and organism's origin to determine if there might be a hazard or potential for RG2 microbes. Jeff Lacey suggested that we could catalog organisms with the same functionality that is used with the biomass group that maintains feedstocks (i.e., bar codes/QR code). Rachel Colby expressed interest in assisting Karin with this activity.

Research postdoc Jeremy Sabo gave a presentation about a seaweed called Sargassum. It has become a serious problem at coastal areas due to the increased CO_2, warmer oceans, and fertilizer run off. The question under consideration for research is can we use this for other purposes such as fuel, feed, cosmetics, or biomaterials. INL is developing a way to store the material because it decays quickly. They are using the expertise that they have developed for ensiling of corns stover for stability for fuel production. Using lactic acid bacteria, they can lower pH and enhance storage time. Seaweed is wet and has unique sugars (alginate, agar, fucoidan, laminarin) as compared to corn stover so new methods are needed. The INL group acquired 18 organisms that could help with storage and have been undergoing a screen for growth on the various sugars (this is the work of a University of Idaho master's student Payton Walker, who is interning at INL). The goal is to then test organism on seaweed to see how they affect seaweed stability. They are also evaluating an organism isolated from seaweed, a potential

advantage for commercial application. The overall goal is to decrease dry matter loss with pressure and lactic acid bacteria.

Jeremy also discussed a thermophilic organism enzyme suite that they were evaluating for improving cellulosic material digestibility. The enzymes were expressed in E. coli then characterized on different non-recyclable paper. They will follow with pyrolysis. The goal is to better understand how the enzyme is breaking down substrates. Part of the solution lies in understanding the structure of the enzyme and the substrate degradation products.

Finally, Jeremy spoke about a project designed to understand how rare earth elements are accumulated and separated by an organism. If we can better understand the mechanism, we may be able to leverage this for metal recovery and purification. If the protein in the organism binds the metals differently it can lead to protein structure changes that can cause the cells to change cellular protein expression to address the problem. Using proteomics we can look for these protein shifts in abundance (increase/decrease) to identify the proteins involved with the shifts.

IBC Chair David Reed provided a short training on the National Institutes of Health guidelines for IBCs. There are guidelines that address most every type of situation. In some cases, the PI can decide, whereas other times the IBC or NIH itself must be involved in the decision-making process. A new requirement for the IBC oversight is when a researcher uses CRISPER. The IBC should be consulted for Risk group 2-4 organisms, restricted agents, shole animals/plants, tissue cultures, 10+ L culture (with recombinant genetics), influenza viruses and gene drive modified organisms (GDMO) e.g., CRISPER-like gene editing systems.

Meeting ended at 5:04 pm and Jeff Lacey moved to end, which was seconded by Karin Adams.