INSTITUTIONAL BIOSAFETY COMMITTEE MEETING
March 29, 2017
3 PM, 264 Brehm Animal Science Building

MEMBERS PRESENT: Chair, Jun Lin; David Bemis, Tamara Chavez-Lindell, Lori Cole, Paul Dalhaimer, Doris D'Souza, Al Iannacone, Melissa Kennedy, Deidra Mountain, Jae Park

Ex-Officio –Linda Hamilton, Scott Moser, Brian Ranger, Jessica Woofter

MEMBERS ABSENT: Seung Baek, Reza Hajimorad, Brittany Isabell, Reggie Millwood, Ling Zhao, Elizabeth Fozo

OTHERS PRESENT: Dr. Wusheng Liu, Dr. Marc Caldwell, Dr. Andrea Lear, Daren Ginete

Opening:

The meeting was called to order by the Chair, Jun Lin at 3:00 PM. The minutes of January 18, 2017 were reviewed and approved as written with one abstention.

IBC Applications:

#177-17 (Andreas Nebenfuehr) Recombinant DNA Registration, III-E-2-a, 3-year rewrite
The research covered under Dr. Nebenfuehr's registration is aimed at the functional characterization of myosin motor proteins in plants. His studies involve the cloning and manipulation of myosin coding sequences from *Arabidopsis thaliana* using standard molecular biology protocols. In addition, fluorescent markers that are based on green-fluorescent protein and its derivatives will be employed for various subcellular organelles. Many of the recombinant genes will be transformed into plants (transiently or permanently) to test for their effect on plant cell behavior and/or localization of the encoded protein. Containment was set at BSL-1. The committee approved the registration as written pending clarification of research aims and purpose in the technical summary.

#207-17 (Reza Hajimorad) Infectious Agents & Recombinant DNA Registration, III-E-2-b-(2), 3-year rewrite
Dr. Hajimorad's research focuses on molecular basis of soybean mosaic virus (SMV) in a soybean model. Specifically, Dr. Hajimorad is investigating phenotypes of soybean plants infected with recombinant and/or chimeric SMV, how the virus induces natural plant defenses, and movement of the virus within plant tissues. The latter is performed using β-glucuronidase-expressing SMV or clover yellow vein virus modified to express SMV genes transiently in soybean plants. Containment was set at BSL-1. The committee approved the registration as written.

#323-17 (Shawn Campagna) Infectious Agent Registration, 3-year rewrite
Dr. Shawn Campagna's research covers the use of several Risk Group 2 organisms including: *Chromobacterium violaceum, Yersinia enterocolitica, Vibrio vulnificus, Vibrio parahaemolyticus, Vibrio cholerae, Salmonella enterica* serovar *Typhimurium, Proteus mirabilis, Neisseria lactamica, Klebsiella pneumoniae, Helicobacter pylori, Haemophilus influenzae, Edwardsiella tarda, Aeromonas hydrophila, Streptococcus pyogenes, Staphylococcus aureus, Listeria monocytogenes,* and *Enterococcus faecalis.* Organisms will be used for (S)-4,5-dihydroxy-2,3-pentanedione (DPD) and glucose assays to understand quorum sensing, cell signaling and consequences on metabolism. Briefly, cultures of no more than 50 mL will be grown overnight in appropriate media. Harvesting in some cases will be performed

at different periods of times, centrifuged and lysed using standard solvents for chemical analysis by LC-MS. Procedures involving these infectious agents will be carried out using BSL-2 facilities, equipment and practices. The committee voted to table the registration pending further information on specific strains, as well as clarification of the non-technical and technical summaries.

#415-17 (Tessa Calhoun) Infectious Agent Registration, 3-year rewrite
Dr. Tessa Calhoun's research covers the mechanisms of microbial resistance to membrane-targeting drugs such as daptomycin and amphotericin B. Her registration proposed growing small-volume cultures of *Enterococcus faecalis*, *Escherichia coli*, and *Saccharomyces cerevisiae*, exposing to antibiotics and stains, preparing/fixing slides, and evaluating drug-membrane interactions using nonlinear microscopic techniques. The committee approved the registration as written with containment set at BSL-1 for most procedures (BSL-2 for aerosol-producing procedures with *E. faecalis*). The committee approved the registration as written.

#416-17 (Qixin Zhong) Infectious Agent Registration, 3-year rewrite
Dr. Zhong's research involves determining the minimum inhibitory and minimum bactericidal concentrations of natural antimicrobials (essential oils, lysozyme, nisin, etc.) necessary to inhibit or inactivate foodborne pathogens. The study will also cover the time-kill growth kinetics of pathogens in microbiological growth media and/or in food matrices such as fruit juices, milk, cheeses, and fresh produce containing antimicrobial compounds. Procedures involve growing small-scale cultures of *Escherichia coli*, *Salmonella enterica* (non-typhi), *Listeria monocytogenes*, *Staphylococcus aureus*, and *Bacillus subtilis*, exposure to natural antimicrobial compounds, and standard plating for enumeration. Containment and safety practices were set at BSL-2. The committee approved the registration pending the correction of typographical errors and clarification of strains antibiotic resistance.

#418-17 (Marc Caldwell) Infectious Agent Registration, 3-year rewrite
Drs. Marc Caldwell and Andrea Lear were present to discuss their research covering bacterial and viral pathogenesis in large animal models. One model investigates the role of *Mannheimia haemolytica* in pulmonary inflammation and bronchopneumonia in a calf model. Additionally, the mechanisms whereby bovine viral diarrhea virus (BVDV) causes primary respiratory infection along with immunosuppression as well as reproductive pathologies in cattle, sheep, goats, or pigs will also be investigated. The final study indicated in the registration involves developing an ovine model for zika virus infection based on similarities to BVDV (both are in the Flaviviridae family) and the lack of good animal models of human disease. All three studies will employ basic biosafety/biosecurity measures including limiting contact with infected animals to authorized study personnel, avoiding trafficking to other areas of the research facility after handling infected animals, rigorous disinfection of contaminated surfaces, etc. The zika study will employ additional ABSL-2 measures including a comprehensive arthropod vector control plan, collection of all solid wastes (food, bedding, and feces) as biowaste, and sharps safety. While the committee generally agreed that the *Mannheimia haemolytica* and BVDV studies included adequate safety/containment parameters, there were several concerns regarding the zika trial, including: 1) arthropod vector remediation if exclusion from the animal suites is unsuccessful; 2) occupational health safeguards, particularly the need for pre- and post-study serum testing for those in contact with infected animals; 3) public health concerns/response should study personnel become infected; 4) the ability to close off open drains in the animal stalls; 5) logistics of stall cleaning/disinfection and handling of liquid waste; and 4) the availability of safety-engineered sharps to reduce the risk of needlestick injuries. The committee tabled the registration pending clarification of facility capabilities, occupational health recommendations, and public health assessments. They also recommended separating the zika trial from the other infectious disease models given the disparate safety/containment considerations.

#419-17 (Neal Stewart) Recombinant DNA Registration, III-E-2-a, 3-year rewrite
Dr. Wusheng Liu was present to discuss Dr. Neal Stewart's research covering the cloning and expressing yield improvement-related genes in soybean (Glycine max) using an *Arabidopsis thaliana* plant model. Standard Agrobacterium-based plant transformation techniques will be used. Containment was set at BSL-1/BL-1-P. The committee approved the registration as written.

#420-17 (Neal Stewart) Recombinant DNA Registration, III-E-2-a, 3-year rewrite
Dr. Wusheng Liu was present to discuss Dr. Neal Stewart's research covering the development of gene activation and repression targeting biotechnology. Briefly, a transcriptional activator and repressor system derived from *Neurospora crassa* will be used to selectively turn on/off bioreporter (pporRFP) gene expression. The system will be tested on tobacco leaves (*Nicotiana tabacum*). Standard Agrobacterium-based plant transformation techniques will be used. Containment was set at BSL-1/BL-1-P. The committee approved the registration as written.

#442 (Goodrich-Blair) Infectious Agents & Recombinant DNA Registration, III-D-4-a, Amendment
Daren Ginete was present to discuss Dr. Goodrich-Blair's amendment covering the subcloning of a shigatoxin 1 subunit A (*stx1a*) homolog derived from *Xenorhabdus bovienii* into standard laboratory *E. coli* strains (Genehogs *E. coli*, NEB 5-alpha, S17 lambdapir, and/or DH5 alpha) as well as additional strains of *X. bovienii*. Although no genes encoding the shigatoxin binding domain have been identified in the recombinant hosts, procedures will be conducted at BSL-2 to ensure safety and containment. The committee approved the amendment as written.

Old Business: *Tabled until next meeting*

New Business: *Tabled until next meeting*

The meeting was adjourned at 4:49 PM. The next meeting is tentatively scheduled for April 19, 2017 in CVM A335A starting at 3 pm.