MINUTES OF THE INSTITUTIONAL BIOSAFETY COMMITTEE MEETING
March 12, 2014
3:00 PM, 223 Plant Biotechnology Building

MEMBERS PRESENT: Chunlei Su, Chair; Jun Lin, Vice Chair; Seung Baek, David Bemis, Tamara Chavez-Lindell, Patti Coan, Doris D'Souza, Paul Dalhaimer, Dan Kestler, Reggie Millwood, Bonnie Ownley, Ling Zhao

Ex-Officio –Brian Ranger, Jonathan Phipps

MEMBERS ABSENT: Al Iannacone, Melissa Kennedy, Jae Park

OTHERS PRESENT: Marc Caldwell, Tessa Calhoun, Lezlee Dice, Reza Hajimorad, Sarah Werner, Wusheng Liu, Sean Pendleton, Yanhui Peng, Nicholas Villarino, Jessica Woofter, Qixin Zhong

Opening:

The meeting was called to order by the Chair, Chunlei Su at 3:02 PM.

Minutes of February 7, 2014 were reviewed and approved pending correction of minor typographical errors.

IBC Applications:

#207-14 (M. Reza Hajimorad) Recombinant DNA Registration, III-E-2-b, 3-year rewrite
Dr. Hajimorad was present to discuss his research covering the 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-glucaronidase-expressing SMV or clover yellow vein virus modified to express SMV genes transiently in soybean plants. The committee approved the registration pending addition of the phytotron location. Containment was set at BSL-1.

#232-14 (Chunlei Su) Infectious Agent Registration, 3-year rewrite
Dr. Chunlei Su was present to discuss his research covering the study of epidemiology and population genetics of *Toxoplasma gondii*. His research will also cover identification of gene expression networks that influence host resistances; determination of the efficacy of *T. gondii* strains in acute and chronic infected mice; and investigate the consequences of co-infection and sequential infection of different genotypes of *T. gondii*. The committee approved the registration pending further clarification of the exposure risks involved with the study, with one abstention. Containment was set at BSL-2.

#323-14 (Shawn Campagna) Infectious Agent Registration, 3-year rewrite
Dr. Shawn Campagna's research covers the use of *Chromobacterium violaceum* for standard antibiotic and chemical sensitivity assays. Sixteen other Risk Group 2 organisms: *Yersinia enterocolitica, Vibrio vulnificus, Vibrio parahaemolyticus, Vibrio cholerae, Salmonella enteric 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* will also be studied using (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 approved the registration pending clarification of conflicting project aims listed in the nontechnical and technical summaries.

#361-14 (Irene Hanning-Jarquin) Infectious Agent Registration, 3-year rewrite
Sean Pendleton and Lezlee Dice were present to provide the committee with a brief narrative of Dr. Hanning's research and answered committee questions. The first objective is to evaluate the efficacy of probiotics (beneficial bacteria), botanicals (plant extracts) and prebiotics (indigestible grains used to promote the intestinal growth of beneficial bacteria) in minimizing or preventing *Salmonella spp.* and *Campylbacter spp.* colonization of poultry. This will be done using common antimicrobial evaluation techniques including disc diffusion assays. To determine the mechanisms of action of these antimicrobials, tools including real-time PCR, RT-PCR, PFGE, DNA sequencing, and DNA microarrays will be used. Potential candidate antimicrobials will be studied for mechanisms of action and also evaluated in vivo with an approved IACUC protocol. The second objective focuses on the potential spread of foodborne pathogens (e.g. *Salmonella spp.*, *Campylbacter spp.*, and *E. coli*) from poultry/livestock to fresh produce on diversified farms which promote rearing livestock and growing fresh produce within the same agricultural system. Briefly, multiple environmental samples will be collected from local farms and cultured to collect any pathogens from the samples. Information collected from the studies will be used to help identify the key sources, track movement of pathogens, narrow the 'how-to' information gap, and help the produce industry to develop strategies and control measures to improve food safety. Standard culturing procedures will be utilized to isolate bacteria of interest. The committee approved the registration pending addition of Dr. Sandra Diaz as a secondary contact. Containment and practices were set at BSL-2.

#367 (Nathan Schmidt) Infectious Agent Registration, Amendment
Dr. Nicolas Villarino was present to provide the committee with a brief narrative of Dr. Schmidt's request to amend his existing registration to study the effects of gut microbiota on the regulation of the severity of malaria using a mouse model. Briefly, feces collected from a target, malaria-exposed population in Mali, Africa (obtained through NIH collaborator) will be transplanted into gnotobiotic mice via oral gavage. All fecal specimens were collected from afebrile individuals and prescreened for intestinal helminthes. The committee approved the amendment as written. The current containment for #367 (BSL-2/ABSL-2) was considered sufficient for the added fecal transplant procedures.

#414 (Sarah Werner) Recombinant DNA Registration, III-E-2-a, New Registration
Dr. Sarah Werner was present to discuss her research covering the isolation and characterization of novel microbes from soil and plant tissue to determine how the immune system in the model plant, *Arabidopsis thaliana*, acts to shape root-associate microbial communities. For these studies, Arabidopsis plants with a variety of immune genes knocked out will be grown in domestic soils or microbes isolated from domestic soils (either North Carolina or Tennessee) in greenhouses or designated plant growth chambers. Community composition and function will then be determined by DNA, RNA, and proteins extracted from soils and root tissue. Novel microbes from soil and plant tissue will also be isolated and characterized. The committee approved the registration as written with containment at BSL-1/BL-1-P.

#415 (Tessa Calhoun) Infectious Agent Registration, New Registration
Dr. Tessa Calhoun was present to discuss her research covering 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*).

#416 (Qixin Zhong) Infectious Agent Registration, New Registration
Dr. Qixin Zhong and Lezlee Dice were present to discuss Dr. Zhong's research 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, Listeria monocytogenes*, *Staphylococcus aureus*, and *Bacillus subtilis*, exposure to natural antimicrobial compounds, and standard plating for enumeration. The committee approved the registration pending the update of Dr. Faith Critzer's training dates. Containment and safety practices were set at BSL-2.

#417 (Chunlei Su) Infectious Agent Registration & Human Derived Materials, New Registration
Dr. Chunlei Su was present to discuss his research covering production of test antigens from *Neospora caninum* for modified agglutination testing. Briefly, the parasite will be grown in human foreskin fibroblast culture, harvested, and fixed in 6% formaldehyde. The committee approved the registration as written with one abstention. Containment was set at BSL-2.

#418 (Marc Caldwell) Infectious Agent Registration, New Registration
Dr. Marc Caldwell was present to discuss his research covering the study of protein markers of pulmonary inflammation and its role in bronchopneumonia among calves. His proposed work will be using *Mannheimia haemolytica* in a calf model. Briefly, calves will receive an endoscopic inoculation of the organisms (3-5 x 10^9 CFU). For 7 days post-inoculation: 1) Blood from the jugular vein will be collected daily for analysis with immunoassays to detect the surfactant proteins and 2) bronchoalveolar lavage fluid will be collected with the aid of an endoscope on days 0, 1, 3, 5, and 7 days post-infection for analysis of surfactant proteins. Study animals will be housed separately, with stalls remaining vacant for at least 21 days post-study. Basic farm biosecurity measures will be implemented, including limiting contact with infected calves to authorized study personnel only and avoiding trafficking to other areas of the research farm after handling infected calves. The committee approved the registration contingent upon IACUC protocol approval and the addition of needle usage (for post-infection blood draws) in the registration procedures. Study was set at BSL-1/ABSL-1 (with biosecurity measures and standard hygiene precautions as described).

#419 (Neal Stewart) Recombinant DNA Registration, III-E-2-a, New Registration
Dr. Yanhui Peng 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. The committee approved the registration as written with one abstention. Containment was set at BSL-1/BL-1-P.

#420 (Neal Stewart) Recombinant DNA Registration, III-E-2-a, New Registration
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. The committee approved the registration as written with one abstention. Containment was set at BSL-1/BL-1-P.

Old Business:

<u>Administrative Report</u>
Brian Ranger provided the committee with the administrative report. Following up on the February 7,

2014 IBC meeting, Dr. Seung Baek's registration (#229-14) was administratively corrected to include grouping of insert genes according to class and function. Dr. Jon Wall's amendment to his registration (#342-12) was approved administratively and included the addition of radiolabeled murine/human CMV and murine/human HSV for terminal *in vivo* imaging studies.

2013 Annual Report (Final Revisions)
Brian Ranger notified the committee that final revisions were made to the 2013 Annual Report. The report has been posted on SharePoint for the committee's review along with the laboratory finding summary. The report will be posted on the Biosafety website and distributed to the research administrators and the Biosafety listserv.

BSL-3 Lab Update
Brian Ranger notified the committee that the Senter Hall location for the BSL-3 lab has been ruled out due to cost. An alternative site in the College of Veterinary Medicine is being looked at as a viable location. Brian notified the committee that he will keep them abreast of any new developments as the project progresses.

New Business:

2014 Biosafety Program Survey
Brian Ranger notified the committee that the annual Biosafety Program survey has been launched as of March 11, 2014. The survey has been modified from a customer service based-analysis to a programmatic gap analysis.

Membership Status/Review
Brian Ranger notified the committee that some committee members will be rotating off as of July 1, 2014. He asked that each committee member email his/her willingness to remain on the committee by Wednesday, March 19, 2014. Dr. Nobles is developing a compensation policy for the IBC Chair. Also, Dr. Nobles will be budgeting for meeting refreshments as well as an annual retreat as recognition of IBC service.

Biosafety Policy Development
Brian Ranger notified the committee that he and Dr. Robert Nobles will be adapting portions of the IBC Charter, including assigned responsibilities, into a comprehensive Biosafety policy.

Other: AALAC Accreditation
Dr. Patricia Coan announced to the committee that the University of Tennessee recently received its AAALAC accreditation letter acknowledging full accreditation with no suggestions for improvement.

The meeting was adjourned at 4:49 PM.

The next meeting has tentatively been scheduled for April 16, 2014.