INSTITUTIONAL BIOSAFETY COMMITTEE MEETING
February 17, 2016
2:00 PM, 410 Plant Biotechnology Building

MEMBERS PRESENT: Jun Lin, Chair; David Bemis, Paul Dalhaimer, Doris D'Souza, Elizabeth Fozo, Reza Hajimorad, Al Iannacone, Melissa Kennedy, Reggie Millwood, Deidra Mountain, Ling Zhao

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

MEMBERS ABSENT: Seung Baek, Tamara Chavez-Lindell, Patti Coan, Brittany Isabell, Jae Park

OTHERS PRESENT: Dr. Elizabeth Lennon, Dr. Susan Pfiffner

Opening:

The meeting was called to order by the Chair, Jun Lin at 2:03 PM. Minutes of December 16, 2015, were reviewed and approved as written.

IBC Applications:

#260-16 (Steven Ripp) Recombinant DNA Registration, III-D-4-a, 3-year rewrite
Dr. Ripp's research covers the development of a transgenic zebrafish that can serve as a bioreporter of estrogenic substances in the environment. Briefly, bioreporter constructs will consist of estrogenic-responsive promoter derived from zebrafish linked to *lux* bioluminescence genes (derived from *Photorhabdus luminescens*). The committee voted to approve the registration pending correction of typographical errors. Containment was set at BSL-1.

#296-16 (Zong-Ming Cheng) Recombinant DNA Registration, III-E-2-a, 3-year rewrite
Dr. Cheng is studying soybean genes involved in fitness and drought resistance. Briefly, drought tolerance genes of interest will be cloned under the control of either endogenous promoters or cauliflower mosaic virus 35 S promoter, CaMV35S, in plant binary vectors. Constructs will then be transformed into soybean host plants via standard *Agrobacterium*-mediated techniques. Plants will be grown in the lab or approved greenhouse under BSL-1 or BL-1-P containment, respectively. The committee voted to approve the registration as written.

#308-16 (Jeff Becker) Infectious Agents & Recombinant DNA Registration, III-D-1-a; 4-b, 3-year rewrite
This registration captured Dr. Becker's use of genetically-modified strains of *Candida albicans* in a mouse model. Briefly, select genes that may play a role in virulence have been placed under the control of a tet-repressible promoter (using standard molecular techniques) to allow for selective control of gene expression during infection. These studies aim to identify genes that play a key role in virulence, which in turn may make suitable targets for antifungal drug development. Prescribed animal containment procedures adhere to BL-2/ABSL2. The committee voted to approve the registration as approved.

#397-16 (Rick Gerhold) Infectious Agents Registration, 3-year rewrite
Dr. Gerhold's registration covers his research on molecular parasitology experiments to determine the epidemiology of infections by comparing the DNA sequences of the various parasites including:

Trichomonas spp. and *Histomonas spp*. in wild bird; *Elaeophora spp.* and *Parelaphostrongylus spp*. from wildlife (primarily ruminants). Procedures will include DNA extraction and PCR testing using commercial testing kits. In addition various animal parasites will be cultured in the lab (in vitro) to perform a battery of experiments to understand the factors associated with infection and disease progression. Further work will include examining potential in vitro chemotherapeutic control options to control parasite infection. The committee voted to approve the registration pending correction of typographical errors, addition of wildlife collection procedures in the non-technical summary, and the revision of the title.

#434 (Colleen Jonsson) Human Derived Materials, Infectious Agents, & Recombinant DNA, III-D-2, New registration

Dr. Jonsson's registration covers Old World and New World hantaviruses and how they interact with the host cell during entry, replication, and assembly. Comparative studies will primarily involve isolation, propagation and amplification (10^5-10^6 pfu/ml) of Old/New World hantaviruses on rat/mouse primary cells, nonhuman primate cells (Vero E6), and human epithelial and endothelial cells. Total RNA will then be isolated for downstream molecular biology assays (i.e. sequencing). Dr. Jonsson's registration also covers expression of recombinant hantavirus proteins (nucleocapsid and glycoproteins) in *E. coli* hosts for protein purification and assay (IFA, ELISA) purposes. The committee tabled the discussion pending correction of problems identified by Mr. Paul Jennette during performance verification testing of the renovated facility (see 'Old Business' below). However, the committee did review the latest revision of the BSL-3 manual and operating procedures. Based on review of primary literature and responses received from other agencies/institutions working with hantaviruses, as well as recommendations from UT occupational health professionals, the committee ruled that respiratory protection is appropriate and mandated its use for all virus manipulations and upon entry unless at least 48 hours have lapsed since laboratory use (assuming proper cleaning and decontamination procedures). Because the latest revision included the respiratory protection requirements, the committee approved the BSL-3 manual and operating procedures pending minor corrections.

#436 (Elizabeth Lennon) Infectious Agents and Human-Derived Materials, New registration

Dr. Elizabeth Lennon was available to discuss her registration covering the role of the mast cell in inflammatory bowel disease (IBD). She will be using a mouse model of IBD, the IL10-/- mouse, as well as a double knockout (DKO) mouse that lacks both IL10 and mast cells (IL10-/- xKitWsh/Wsh), to determine the role mast cells are playing. Post-mortem samples will be obtained from mice that have developed IBD and healthy mice in order to determine how mast cells are impacting the disease. The proposed work will be important to discover new therapeutics or preventative strategies. Additionally, intestinal helminths have been shown to have a protective effect against immune-mediated diseases such as IBD. She will use the rat tapeworm, *Hymenolepis diminutia*, to study the effects of this parasite on immune function in the intestine using *in vitro* models with intestinal cell lines and mast cells (including human-derived cell lines). The committee approved the registration contingent upon completion of lab set-up and certification of the biosafety cabinets. Containment was set at BSL-2.

#437 (Rachel McCord) Human Derived Materials & Recombinant DNA, III-D-3, New registration

Dr. McCord was available to discuss her research on linear genome sequence functions in a three dimensional context as chromosomes are folded and packaged into the cell nucleus. Three dimensional folding has implications for the proper expression, replication, and repair of genes, and misfolding can lead to disease. This research will use a combination of microscopy and molecular biology techniques to investigate the three dimensional structure of the mammalian genome. A complementary imaging approach will be to target a fluorescent protein to certain chromosomal regions using the new CRISPR approach in human and mouse cell lines so that the position of that genomic region can be monitored in live cells. Specifically, these techniques will be used to identify changes in 3D genome structure in the

following systems: 1) B16-F1 mouse melanoma cell line cells migrating through small pores, 2) nuclei isolated from GM12878 human lymphoblast cell line subjected to artificial physical perturbations, and 3) human K562 cell line cells expressing a mutant protein progerin that mimics the cellular effects of the premature aging disorder Hutchinson Guilford Progeria Syndrome. Finally, the registration outlined SOPs for use of a lentiviral vector delivery of the CRISPR/Cas 9 in the event that transient transfections do not work. The committee voted to approve the registration as written. Containment was set at BSL-2.

#438 (Susan Pfiffner/Steven Ripp) Infectious Agents, New registration
Drs. Pfiffner and Ripp's registration covers their research on the disinfection efficacy of a proprietary instrument designed for the biological treatment of waste waters. The studies consist of single and mixed populations of target bacteria and will be conducted under continuous flow conditions to determine the exposure times and optimal conditions necessary to achieve a 6 log reduction in bacterial concentrations. Testing assays will consist of live/dead microscopic counts, viable plate counts, and Pseudalert test kits. Target bacteria will consist of *Pseudomonas aeruginosa*, *Pseudomonas fluorescens*, and *Escherichia coli*. The committee approved the registration pending the addition of the maximum volume, list of chemical byproducts, and cleaning procedures. The procedures are to be conducted using BSL-2 precautions.

Old Business:

Administrative Report
Brian Ranger provided the administrative report. Following up on December 16, 2015 IBC meeting, Dr. Ahmed Bettaieb (#432) purchased a biosafety cabinet and had it certified on 12/28/2015. Dr. Marc Caldwell (#435) and his personnel completed requisite BSL-2 training. He is still awaiting USDA approval for receipt of bovine viral diarrhea virus (BVDV). Dr. Maria Cekanova's registration (#395-15) was administratively amended to include additional human cell lines (A373 & M21 melanoma; MDA-MB-231 breast cancer; Panc-1 & BxPC-3 pancreatic cancer), some may be used in xenografts in immunocompetent pigs (Dr. David Anderson, LACS, IACUC #2382). Dr. Neal Stewart's registration (#379-15) was administratively amended to include the use of Greenhouse 15 for exposing approved transgenic switchgrass constructs to seasonal cold weather. Greenhouse 15 supports BL-1-P containment. Dr. Tarek Hewezi's registration (#398) was administratively amended to include the addition of Dr. Meg Staton, Assistant Professor, EPP (and her graduate student). Dr. Hewezi was also approved for additional bay space in the North Greenhouse. All procedures will be conducted as previously approved.

BSL-3 Updates & Discussion of Facility Management Plan
Brian provided the committee with an updates concerning the BSL-3 lab. Mr. Paul Jennette, PE, RBP, Cornell University, was onsite January 25-27 to perform independent review and performance verification on the new lab. He found air flow issues and suggested adding a partitioning door in the long section of the lab. He also identified problems relative to the security programming logic, unsealed penetrations, and emergency lighting. The committee approved the BSL-3 laboratory manual and the facility management plan contingent upon inclusion of mandatory respiratory protection and completion of Mr. Jennette’s imperative recommendations.

IBC/Biosafety Program Self-Audit Updates (Dr. Fozo/Dr. Coan)
Dr. Fozo addressed the committee regarding the IBC/Biosafety Program Self-Audit. She listed several items within the charter and program that needed to be addressed. Items included: recruitment and terms/retention of members; institutional recognition of faculty/staff service to the IBC; charter

updates; and the revision or inclusion of standard operating procedures for handling various situations. Dr. Fozo also addressed awareness and publication of IBC meetings. Open publication on the Biosafety website should meet the expectation (calendar openly available and can be found through standard web searches). However, IBC activities and announcements should be reiterated by department heads to foster better awareness. The Self-Audit subcommittee recommended an institutional trainer to cover various aspects of safety/compliance to the AVCRE. Finally, there should be additional attention to/documentation of lab-specific hazards, either through training or laboratory postings.

New Business:

IBC Management Best Practices – State College, PA

Brian and Linda attended an IBC best practices conference at State College in Pennsylvania on November 17-20, 2016. There were several useful recommendations for improving coordination and management of the IBC. There were also helpful tips to help ensure compliance with the *NIH Guidelines*. Some of the identified gaps have already been addressed via the IBC registration form (additional fields or clarifications).

Federal Memo – Re: Biosafety and Biosecurity-Background, Proposed Measures, & Implications for UT

Brian notified the committee about the joint memo from DHS and Science/Technology to the Federal Cabinet concerning national biosafety and biosecurity policies. Though most of the memo was specific to institutions and agencies subject to the Select Agents Program, there were several facets, including a proposed OSHA Biohazards Standard, which addressed biosafety/biosecurity more broadly. Based on a quick and informal gap analysis, the University of Tennessee already has many of the programmatic elements recommended in the memo, including processes for systematic review, accountability and training.

Proposed Changes to Training Program

Brian notified the committee that he is currently looking in various training formats. CITI training was one of the possibilities.

Proposed Changes to Lab Inspection Program Including Self-Audit Tool (Linda Hamilton)

Linda Hamilton addressed the committee about proposed changes to the lab inspection process. She has developed an online self-assessment tool for principal investigators through Qualtrics. This self-assessment will be added to the end of the annual update form and replace one of the semi-annual site visits. The new process should: 1) remind PIs/laboratories of the expectations; 2) help identify problem areas or gaps that can be resolved prior to an official site visit; and 3) foster better communication between the Biosafety Office and the research community.

The meeting was adjourned at 4:10 PM.

The next meeting has been tentatively scheduled for March 23, 2016.