Compliance: IACUC / IBC

Yue-Wern Huang, PhD
Professor, Biological Sciences
Chair, Missouri Institutional Animal Care and Use Committee (IACUC)
Chair, Missouri Institutional Biosafety Committee (IBC)
Faculty Fellow, Vice Chancellor for Research & Innovation

S&T Institutional Animal Care and Use Committee (IACUC)

Mission: Oversee the university's animal facilities, programs, and humane treatment for all vertebrate animals used for research and education, no matter whether funded or un-funded.

Why important?

Institutions must have an Animal Welfare Assurance to receive Public Health Service (PHS) funds

Jurisdiction: NIH Office of Laboratory Animal Welfare (OLAW)

GUIDELINES, POLICIES AND REGULATIONS

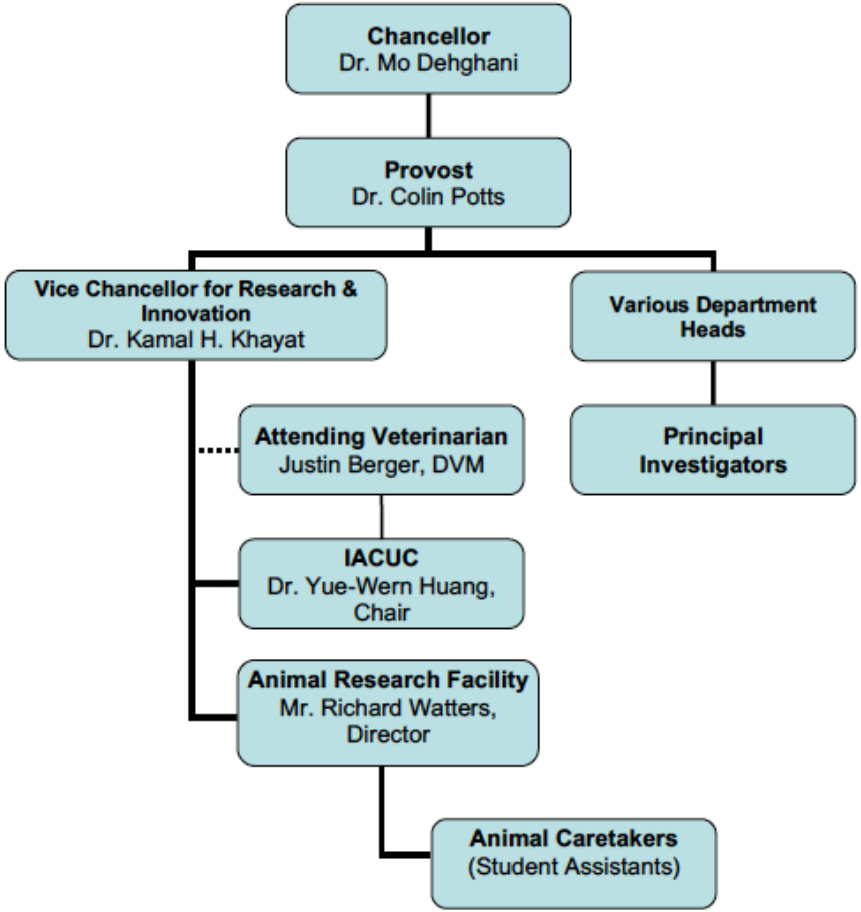
NIH Office of Laboratory Animal Welfare Website:https://olaw.nih.gov/home.htm

The PHS Policy for the Humane Care and Use of Laboratory Animals:https://olaw.nih.gov/policies-laws/phs-policy.htm

The National Research Council (NRC) Guide for the Care and Use of Laboratory Animals: https://grants.nih.gov/grants/olaw/guide-for-the-care-and-use-of-laboratory-animals.pdf

The AVMA Guidelines on Euthanasia: https://www.avma.org/KB/Policies/Pages/Euthanasia-Guidelines.aspx

The ARENA/OLAW IACUC Guidebook: https://olaw.nih.gov/guidance/ARENA-OLAW-IACUC-guidebook.htm (ARENA=Applied Research Ethics National Association)


Chancellor
Dr. Mo Dehghani
Provost
Dr. Colin Potts
Vice Chancellor for Research & Innovation
Dr. Kamal H. Khayat
Various Department Heads
Attending Veterinarian
Justin Berger, DVM
Principal Investigators
IACUC
Dr. Yue-Wern Huang, Chair
Animal Research Facility
Mr. Richard Watters, Director
Animal Caretakers
(Student Assistants)

IACUC Composition

- Attending veterinarian
- Scientists
- Nonscientist: non-scientific areas (ethics, lawyer, etc)
- Nonaffiliated member: Rolla community citizen in the proper care and use of animals

Current IACUC Membership

- Attending Veterinarian: Justin Berger , DVM
- Scientists: Yue-Wern Huang; Chen Hou; Richard Watters; Jimmy Rolufs
- Non-Scientist: Michael Davis
- Non-affiliated Member: Anna Ulrich

Animal Use and Care Protocol Approval

Under regulation: Vertebrate animals

NIH OLAW: Rodent species

USDA: Rabbit, guinea pig

Animal Use and Care Protocol Approval

Process:

1. Contact Yue-Wern Huang @ huangy@mst.edu; 573-341-6589
2. Submit an animal care and use protocol
3. Reviewed by the IACUC members: FCR vs. DMR
4. Withheld or approved
5. Receive training provided by Yue-Wern Huang and Richard Watters
6. Contact Richard Watters about use of the vivarium
7. Post-approval management
8. Significant changes in the approved protocol (see the next slide)

Significant Changes

a. in the objectives of a study
b. from nonsurvival to survival surgery;
c. resulting in greater discomfort or in a greater degree of invasiveness;
d. in experimental substances and/or sedation;
e. in housing or use of animals in an area not overseen by the IACUC;
f. that adversely impact personnel safety;
g. to a strain that has a more adverse phenotype or decreased immunocompetency;
h. in any increase in animal numbers from the originally proposed[1];
i. in Principal Investigator;
j. in anesthetic agent(s) or the use or withholding of analgesics;
k. in the method of euthanasia; and
l. in the duration, frequency, or number of procedures performed on an animal

Users Training Programs

Users: postdocs, students, staff scientists

- Written Test (administered by IACUC Chair)
- Hands-on Training and Test (administered by vivarium director)
- Complete eCompliance modules
  - https://ecompliance.missouri.edu/
    - Confidential Health Questionnaire Form
    - Hazard Evaluation Form

➢ Tetanus shot record

Violations of Animal Care and Use

Individual users:

- Suspension the use of animals AND research activities
- Disciplined or dismissed by the university

Institutional level:

- Not eligible for federal funding
- Vivarium shutdown
- May receive federal penalty
- Lawsuit by citizens or citizen groups

S&T Institutional Biosafety Committee (IBC)

Mission: The S& T IBC is charged by federal law to review and approve elements of a campus biosafety program. The purpose of this program is to ensure the health and safety of all personnel working with biohazardous materials. The biohazardous materials include synthetic or recombinant nucleic acids, microbial vectors that spread infectious diseases, and federal select agents.

Jurisdiction: NIH Office of Biotechnology Activities

The IBC works closely with S&T EHS

Oversight for Basic rDNA Research

Coordinated Framework

FEDERAL		LOCAL
Regulatory Policies	Research Policies	
USDA	NIH	Institution
FDA	NSF	IBC
EPA	EPA	Investigator
OSHA	OSHA	

Oversight for Human Gene Transfer Research

FEDERAL	LOCAL
OHRP	Institution
FDA	IRB
NIH	IBC
	Investigator

GUIDELINES, POLICIES AND REGULATIONS

- NIH Guidelines for Research Involving Recombinant or Synthetic Nucleic Acid Molecules
- Biosafety in Microbiological and Biomedical Laboratories

What Research is being regulated?

- Synthetic or recombinant nucleic acids
- Select agents and toxins
- Xenotransplantation
- Stem cell research
- “Dual Use” research
  - research conducted for legitimate purposes that generates knowledge, information, technologies, and/or products that could be utilized for both **benevolent** and **harmful purposes**
- Nanotechnology

Features of Biohazardous Agents

- They include bacterial agents, fungal agents, parasitic agents, viruses
  - Biological agents known to infect humans
  - Selected animal agents that may pose theoretical risks if inoculated into humans

Biohazardous Agents by Risk Group (RG)

Risk Group 1 (RG1)	Agents that are not associated with disease in healthy adult humans
Risk Group 2 (RG2)	Agents that are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are *often* available
Risk Group 3 (RG3)	Agents that are associated with serious or lethal human disease for which preventive or therapeutic interventions *may be* available (high individual risk but low community risk)
Risk Group 4 (RG4)	Agents that are likely to cause serious or lethal human disease for which preventive or therapeutic interventions are *not usually* available (high individual risk and high community risk)

Risk Level Assessment

Risk Group (RG) of an agent:

- **Relative pathogenicity for healthy adult humans**
  - Does not factor in preexisting diseases, medications, compromised immunity, pregnancy or breast feeding
- **Decision of appropriate containment (biosafety level; BSL):**
  - Virulence, pathogenicity, infectious dose, environmental stability, route of spread, communicability, operations, quantity, availability of vaccine or treatment, gene product effects
    - Enhanced strain vs. attenuated strain
    - In vitro vs. in vivo: dengue virus; BSL-2 in vitro, but higher in animal inoculation or transmission studies

Examples

- Deliberate transfer of a drug resistance trait to microorganisms that are not known to acquire that trait naturally
- Deliberate formation of recombinant or synthetic nucleic acid molecules containing genes that express toxic molecules lethal to vertebrates at an LD_{50} < 100 ng/kg B.W.
- Animals that contain sequences from viral vectors, which do not lead to transmissible infection either directly or indirectly as a result of complementation or recombination in animals, may be propagated under conditions of physical containment comparable to BL1 or BL1-N and appropriate to the organism under study.
- SARS-CoV-2 studies

IBC Composition

- At least five individuals
- Appropriate recombinant and synthetic nucleic acid expertise collectively
- Plant and animal experts, biosafety officer
- At least two members not affiliated with the institution

Current IBC Membership

Voting Members:

- Yue-Wern Huang (Chair)
- Melanie Mormile (microbiologist)
- Mark Fitch (environ. eng.)
- Jimmy Rolufs (biosafety officer; BSO)
- Rachel Carter (community member)
- Lee Beckwith (community member, MD)

Non-Voting Members:

- Michelle Bresnahan (Director, S&T EHS)
- Cathie Eikermann (S&T Compliance Official)

Registration Document (RD) Approval

- Contact Yue-Wern Huang: huangy@mst.edu
- Submit a registration document to IBC for approval
- Facility inspection
- Registration document approval
- Users training

Required Documents for all Applications

- IBC Registration Document
- PI(s) Biosketch
- Missouri S&T Biological Hygiene Plan (https://ehs.mst.edu/labsafety/biologicalsafety/)
- Missouri S&T Chemical Hygiene Plan (https://ehs.mst.edu/labsafety/chemicalsafety/)

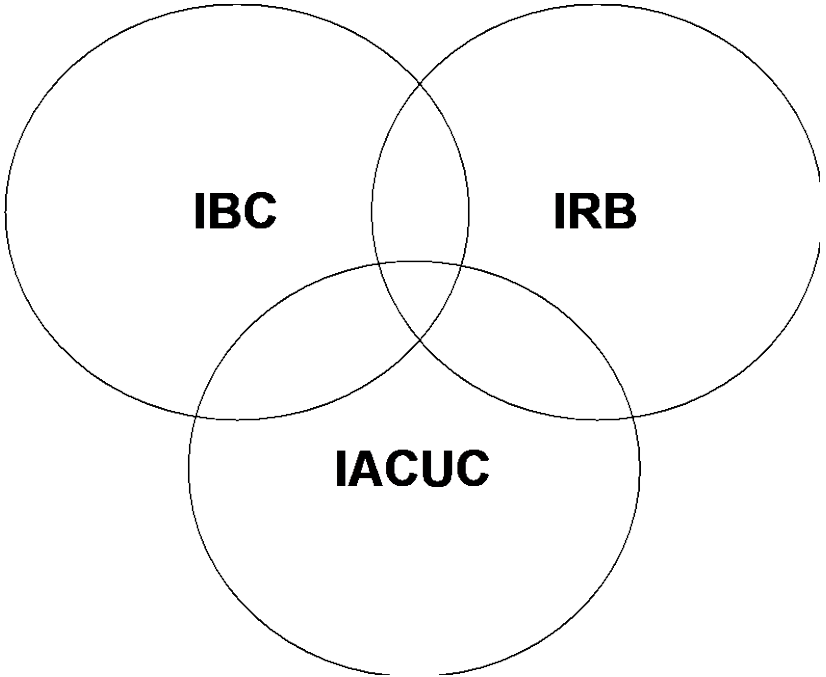
Documents Submitted as an Appendix

- **Lab Sketch**: Required for all BSL-2 or higher labs. The sketch should include the location of exits/entrances, BSL2/BSL3 equipment (centrifuges, incubators, etc.), biosafety cabinet(s), sinks, benches, etc.
- **Animal Hazard Summary**: Required for protocols involving the introduction of biohazardous agents to animals. The approved file must also be submitted to the animal facility manager.
- **Self-Inspection Checklist**: Required for all BSL-1 labs, and for annual reviews of BSL-1 and BSL-2 labs.
- **On-site Inspection**: An on-site inspection must be scheduled for all BSL-2 new and/or renewal protocol submissions.

Users Training Program

- Missouri S&T Environmental Health and Safety Department (EHS)
  - Autoclave Training: Required for all personnel listed on all protocols.
  - Biosafety Cabinet Training: Required for personnel listed on BSL-2 protocols.
  - Blood-borne Pathogens Training: Required for personnel working with human and/or non-human primate agents. This training must be completed annually.
  - Respiratory Training: Required for all personnel working with aerosol hazards including nanoparticles. This training must be completed annually. Fit-testing must be completed during the initial training.
- NIH Guidelines Training: Required for all personnel working with recombinant and/or synthetic nucleic acids and/or modified organisms.

IBCs and Other Institutional Research Oversight Committees



IBC & IACUC

IBC Review	IACUC Review
▪Risks to human health ▫ Transfer of genetically altered material, viral vectors etc. ▪Risks to the environment ▫ Escape and establishment in the wild ▫ Interbreeding with wild stock ▫ Consumption by other animals	▪ Animal welfare ▫ Pain and distress from adverse phenotypes (behavioral, anatomical and physiological abnormalities) ▫ Risks to other animals in the facility from the inadvertent spread of vectors

IBC & IRB

IRB Review	IBC Review
▪ Conducts risk/benefit assessment relative to individual research participants (physical, psychological, social harms) ▪ Selection of subjects and the informed consent process ▪ Data monitoring provisions to ensure the safety of subjects ▪ Provisions to protect subject privacy and confidentiality of data ▪ Injuries or any other unanticipated problems ▪ Compliance with regulations	▪ Research for conformity with the *NIH Guidelines* ▪ Potential risk to environment and public health (risks to close contacts, health care workers, and the community, as well as to individual research participants) ▪ Containment levels per *NIH Guidelines* ▪ Adequacy of facilities, SOPs, PI and other personnel training ▪ Institutional and investigator compliance (e.g., adverse event reports) ▪ Reviews trial design, biosafety and containment, and compliance with *NIH Guidelines*

Violations of Biosafety

Individual users:

- Suspension of research activities
- Disciplined or dismissed by the university

Institutional level:

- Not eligible for federal funding
- May receive federal penalty
- Lawsuit by citizens

Questions?