Purpose

• To provide ABSL-2 training for animal care staff
• To protect and prevent worker exposure
• Topics
  – Hazards
  – Risk Assessment
  – PPE
  – Work Practices
  – Occupational Health
Hazards

• Human Cell Lines
  – Pathogens
    • Hepatitis B; C
    • HIV
    • Epstein Barr
    • HPV (HeLa)
    • The Unknown...
  – Cancer Cell Lines
  – Rodent Cell Lines
    • LCMV
LCMV Outbreak in Nude Mice

- LCMV (Lymphocytic Choriomeningitis)
  - Three cases of infection in research labs
  - Infection
    - No symptoms
    - Severe meningoencephalitis (rare)
  - Seven workers infected
  - Transmission Unknown
    - Cage cleaning
    - Bedding
    - Water
Risk Assessment

• Varies on a case-by-case basis
• Intrinsic properties
  – Source
    • Primary versus secondary
  – Types
    • Skin versus liver
• Adventitious agents
  – Parasites
  – Bacteria
  – Viruses
  – Fungi
  – Prions
Risk Assessment (Cont.)

- Type of Activities
  - Animal transfers
  - Decontamination
  - Bedding and animal disposal
Animal Biosafety Levels

- **ABSL1** – Minimal hazard – generally safe for healthy human adults - well characterized
  - Animal cells
  - AAV (Adeno-associated virus)

- **ABSL2** – Moderate potential hazard – immunization or treatments available – low morbidity/mortality
  - Human/NHP (blood, cells, tissue)
  - Lentivirus

- **ABSL3-4** – Serious/potentially lethal diseases – inhalation route exposures - unknown risk of transmission
  - Ebola
Differences between ABSL-1 and ABSL-2

• Hazard assessment
• Occupational Health
• Decontamination of equipment, cages
• PPE
• Use of a biological safety cabinet
• Wastes autoclaved/incinerated
ABSL-2 Facility Design

- Secured door - authorized personnel only
- Directional airflow
- Biological Safety Cabinet
- Hand washing sink or sanitizer near exit
- Eyewash and safety shower available
- Autoclave available
- Work surfaces water resistant/easily cleanable
Potential Routes of Exposure

- Bites and scratches
- Surface contact (contaminated work area)
- Inhalation (aerosol generating procedures)
- Mucous membrane (eyes, nose, mouth)
ABSL-2 Personal Protective Equipment (PPE)

- **Lab coat**
  - Worn over scrubs
  - Buttoned completely down the front
  - Elastic cuff preferred

- **Face shield/Surgical mask**
  - Protects entire face

- **Gloves**
  - Long enough to extend over cuff of lab coat
  - High risk gloves (8 mil) recommended

- **Close-toed shoes**
  - Protects feet from contamination
Additional/Alternative PPE

• Gowns (water impermeable)
  – frontal contamination

• Respirator –
  – Respiratory protection program
  – Fit testing
  – Training

• Booties – shoe protection/tracking contamination
ABSL-2 Requirements

• Lab signs
  – EHS placard
  – ARC sign
• Cage cards indicating hazard
• Hazardous animal project initiation form posted
• Site-Specific training
  – Provided by PI
• Universal precautions
  – Treat everything as infectious
Hazardous Animal Project Initiation Form

• Site-specific conditions for room
• Section 1: Responsible parties and location
  – Study contact information
  – Project information
• Section 2: Hazard and precaution summary
  – Materials
  – Dose/route of administration
    • Washout/clearance period
  – Specific husbandry precautions
    • PPE
    • Emergency procedures
ABSL-2 Work Practices
Containment Devices

• Biological safety cabinet (BSC) – Class II
  – Work surfaces wiped down/disinfected
    • Never place head inside chamber
    • Assist devices (swiffer)

• Static micro-isolator cage or ventilated cage rack (negative pressure)

• Certified annually
Work Practices – Animal Transfers

- Should conducted in biological safety cabinet
- Disinfect cabinet before using
- Use tray liner; wet with disinfectant before using
- Work from dirty to clean
- Close cages and disinfect before removing
- Disinfect cabinet before leaving
- Disinfect equipment
- Change gloves after removing from BSC
Exiting the Room

• Sanitize hands before exiting
• Remove PPE
  – Glove removal technique
  – Lab coats should be laundered after 40 hours use
• Disinfect re-usable PPE
  – Face shield
• Wash hands
ABSL-2 Waste

• Biohazardous waste
  – All wastes placed in biohazard bag
    • Animal carcasses: EHS Freezer
    • Used cages: Autoclave
  – Seal bag with autoclave tape
    • Leakproof, autoclavable
  – Spray bag with disinfectant
  – Transport using cart with side rails or secondary containment
Occupational Health/EHS

• Immunizations
  – Hepatitis B

• Consultation
  – Immunocompromised/pregnant workers

• Notify EHS if an incident occurs in lab
  – Spill
  – Exposure