

# ABSL-2 Training ARC Personnel (OH 227)



The University of Texas at Austin



Environmental  
Health & Safety

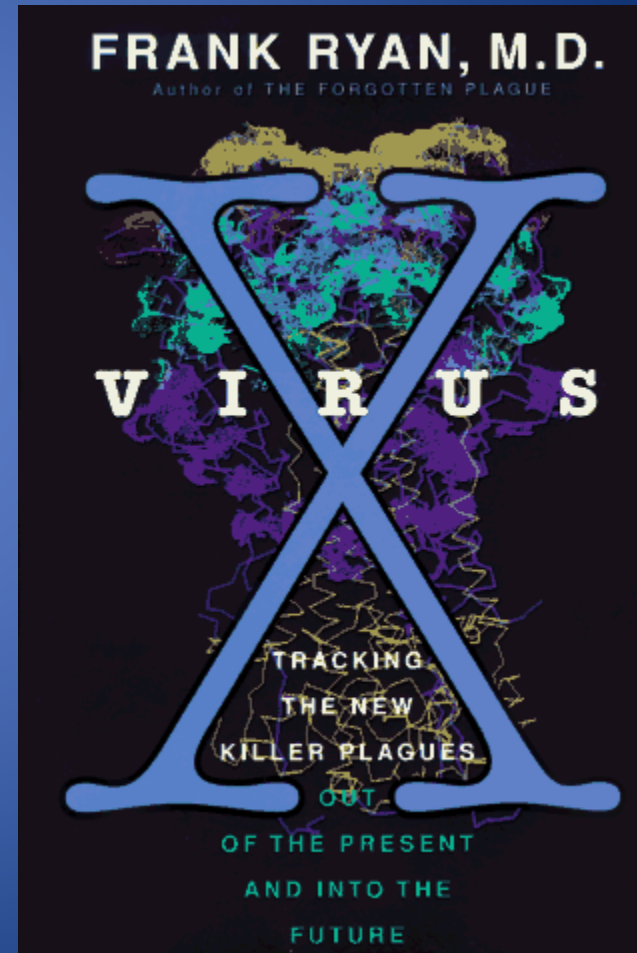
# Purpose

- 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
- LCMV Outbreak at Cancer Research Institute (1989)
  - Infection
    - No symptoms
    - Severe meningoencephalitis (rare)
  - Seven workers infected
  - Transmission Unknown
    - Cage cleaning
    - Bedding
    - Water

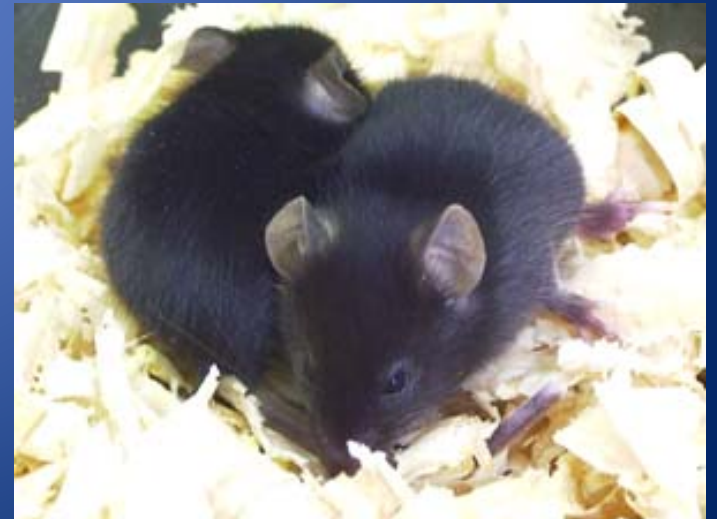
# Risk Assessment

- Varies on a case-by-case basis
- Intrinsic properties
  - Source
    - Primary versus secondary
  - Types
    - Skin versus liver
- Adventitious agents
  - Parasites
  - Bacteria
  - Viruses
  - Fungi
  - Prions



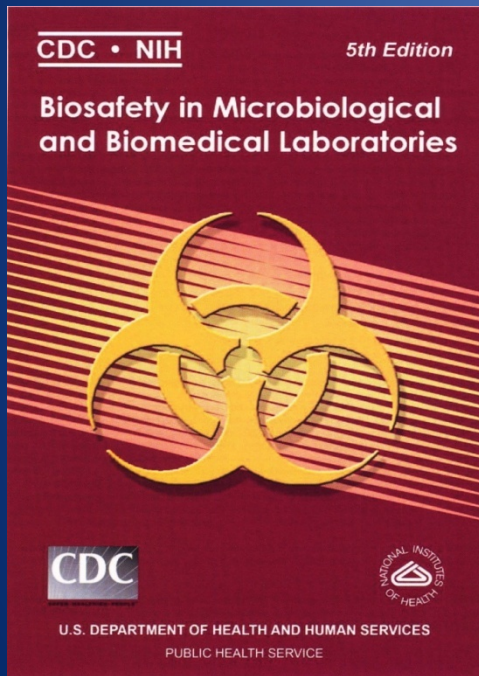
# Risk Assessment (Cont.)

- 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 be 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