Immunology
Basic Lab Safety
&
WHMIS

Sam Kung & Christine Mesa
Safety Coordinator
Department of Immunology
Worth reviewing every year

Safety is important for everyone

Safe place to work

Need to keep our Biosafety Permit in order to do our work

Need to obtain a Biosafety Certificate for each new research grant we received
To apply for a Biosafety Certificate:

In addition to the funded project summary, short description of the proposed work, ethical approvals, signed form.

Active and updated biosafety permit (inventory, location, users, completed training courses, lab-specific SOP).
THANK YOU

Christine Mesa
Kennedy Makondo
Bill Stefura

Steve Cole, EHSO

LMC

All of you
OUTLINE OF THIS PRESENTATION

Responsibility
Checklist
Working Alone Policy
Spills
Fire Safety

Lab specific Safety Program (chemical, biological, CLIP)
Responsibilities for Safety
Responsibilities for Safety

Principal Investigator / Supervisors:

provide workers with:

- a safe work environment
- adequate safety equipment
- safety training
Responsibilities for Safety

Employees and Students:

- follow Departmental and Principal Investigator’s established safety protocols

- use reasonable care to protect your safety and the safety of others

- bring safety concerns to the attention of the principal investigator or the designated safety individual.

HAVE THE RIGHT TO REFUSE TO DO WORK THAT YOU CONSIDER TO BE UNSAFE
Accident/Incident Reporting

- Legislation requires that all accidents, incidents and near misses shall be investigated and a report completed.

- Incidents include the following:
  - personal injury (including needle sticks)
  - occupational illness
  - fire/explosion
  - property and equipment damage
  - environmental damage
  - near miss incidents (those incidents that could have resulted in any of the above losses)
Accident/Incident Reporting

Staff and Students:

Report the incident to your supervisor immediately: verbally or using the Employee’s Green Card— Notice of Injury Form available on EHSO web-site and also in the folders near main entrance of the lab.
Accident/Incident Reporting

Procedures - Serious Accidents and Injuries

- When a serious accident occurs at a workplace, the employer (UM) must notify Manitoba Labour-Workplace Safety and Health Division as quickly as possible.
- During regular hours: EHSO at 474-6633.
- If after hours: U of M Security at 555 or HSC at 55

Serious accidents include:
- a death or serious injury
- uncontrolled spill of a hazardous material
- explosion, fire or flooding
Chemical (WHMIS) and Biological Safety Checklist for Staff, Students and Visitors

Name: ___________________________  Position: ___________________________
Lab: ___________________________  Start date: ___________________________

For any new person working in the department, please fill out this form and give copy to WHMIS coordinator or Immunology Department Administrative staff.

It is the responsibility of the PI to ensure that any staff, student, or visitor/user coming to use equipment in the lab completes/has completed the U of M online Biological Safety training and quiz, and the online WHMIS training and quiz.

The following documents replace the old Immunology Biosafety questionnaire and can be found at this website:

☐ Laboratory Safety Checklist for New Lab Personnel (copy to be kept by WHMIS coordinator OR Department Administrative office)
☐ EHSO Generic Biosafety training Powerpoint
☐ Biosafety Quiz

WHMIS Program

http://umanitoba.ca/admin/human_resources/ehso/chemical_safety/WHMISProgram.html

☐ WHMIS Online Training Presentation
☐ WHMIS Test

There will be a yearly departmental WHMIS presentation, which is mandatory for anyone working in the department to attend.
Chemical (WHMIS) and Biological Safety Checklist for Staff, Students and Visitors (cont’d)

PIs are also responsible for ensuring new staff/students obtain vaccines if their work exposes them to vaccine preventable diseases:


☐ Fill out and submit Risk Assessment worksheet

If you work with Human blood and body fluids or Animals, please post the Post Exposure protocol in your lab areas, so staff/students know how to deal with accidental exposure from cuts or needlestick injuries.

Each lab also needs to have a working alone policy
http://www.umanitoba.ca/admin/governance/governing_documents/staff/839.html

☐ New Staff/Student/Visitor is aware of working alone policy
Department of Immunology
Safety Self-Assessment online form

New trainees should complete the questionnaire and discuss it with the supervisor
Departmental Working Alone Policy

Workplace Safety and Health Act recognizes that certain workplaces require staff to work alone and therefore requires that a plan is in place that is agreeable to both the employer and employee. The plan should be based on a realistic risk assessment of the hazards under the circumstances and include a written emergency response plan.

Review your Department’s “Working Alone Policy” – The Uzonna Policy that includes:

- Mandatory buddy system where staff and students must work in pairs.
- Supervisor notification before starting work after hours.
- Restrictions to certain types of work.
General Lab Safety: Spills - General Guidelines

Additional Departmental Spill Kit Supplies

- In addition to basic lab spill kits, Departments should also provide the following:

  1) Emergency contact lists.
  2) Commercial mop and pail.
  3) Full size “washable” broom and dustpan.
  4) Respirator with multi-purpose P100 cartridges suitable for acids, ammonia, amines, chlorine organic vapours as well as fine particulates, and dusts.
  5) Additional “emergency” stash of disposable supplies like universal pads, caution tape, gloves, disposable bags and autoclave bags.
Fire Safety

- Get to know the alarm bell scenarios in your building.
- When you hear a fire alarm you should turn off all flames and gas sources and prepare to exit the building via the stairway.
- If you need assistance proceed to nearest stairway and await the FIRE WARDEN
- Know the area where to assemble
- Karen and Susan are our Fire Marshalls

Contacts for departmental fire information / training and the fire wardens are posted at your Departmental Office.
Lab Specific Safety Programs

- Chemical (WHMIS)
- Biological
- Combined Lab Inspection Program (CLIP)
- Radiation
Lab Specific Safety Programs

- Chemical (WHMIS)
WHIMS

Workplace Hazardous Materials Information System
WHMIS: Goal

- To reduce injury and illness from exposure to hazardous materials in the workplace
WHMIS: Three Key Elements

1. Worker Education and Training
2. Labels
3. Material Safety Data Sheets (MSDS)
How to properly store chemicals...

Help identify safe storage of chemicals (ie. Acetic Acid is a flammable and should be in flammable cabinet and not just under fume hood)

Help identify incompatible chemicals (ie. Hydrogen Peroxide and Ethanol should not be stored together—an oxidizer and a flammable)

And how to properly dispose of chemicals...
WHMIS at the U of M

Chemical Safety

Chemical Safety Program provides information for the recognition, evaluation, and control of hazardous chemicals. This program provides guidance for safe handling, storage, and use of these chemicals.

WHMIS Program
WHMIS Coordinator Information
New Laboratory Personnel Safety Checklist
Guidelines for the Use, Storage and Handling of Chemicals
Flammable Liquid Storage Policy
Dispensing of Flammable and Combustible Liquids
Storage of Flammable and Combustible Liquids in Laboratories
Guidelines for Storage of Laboratory Chemicals

Alphabetical listing of EHSO Lab-related resources
Potentially Explosive Chemicals
Work Practice for Lab Fume Hood
Eyewash/Safety Shower Information
Minors in Laboratories
Working Alone
WHMIS Program

Workplace Hazardous Materials Information System (WHMIS) is Canada’s hazard communication system. WHMIS was developed to provide workers with information on the safe use, storage, production, or handling of hazardous materials, also referred to as controlled products, in the workplace.

Any person supplying or using controlled products must comply with WHMIS legislation: Manitoba Regulation 217/2006 Workplace Safety and Health Regulation.

WHMIS Reference Chart
WHMIS Label Order Form
WHMIS Workplace Avery Label

Training
WHMIS Online Training Presentation
WHMIS Handbook

WorkSafeBC WHMIS Videos
Overview of WHMIS
Classification
Labels
Material Safety Data Sheets

WHMIS Test

MSDS Information
Create an MSDS (e.g. for a mixture)
Government of Canada MSDS Resource
Fisher Scientific
Sigma Aldrich
Public Health Agency of Canada
Pathogen Safety Data Sheets
Other MSDS resources
## General Chemical Organization

<table>
<thead>
<tr>
<th>Category</th>
<th>Storage Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammables</td>
<td>Store in flammable storage cabinets</td>
</tr>
<tr>
<td>Bases</td>
<td>Store separately</td>
</tr>
<tr>
<td>Oxidizers</td>
<td>Store separately</td>
</tr>
<tr>
<td>Acids</td>
<td>Store in corrosive resistant acid cabinet</td>
</tr>
<tr>
<td></td>
<td><strong>EXCEPT</strong>: chromic, nitric, and perchloric acids which should be stored separately</td>
</tr>
<tr>
<td></td>
<td>Glacial acetic acid should be stored as a flammable</td>
</tr>
</tbody>
</table>
WHMIS Controlled Products: Hazard Classes & Symbols

Class A: Compressed Gases

Risks:
- Physical hazard (120kg)
- Explosive hazard (if heated, dropped or impacted)
- Content hazard (could be flammable, poisonous)

Examples:
- CO₂ tanks
- N₂ tanks
- O₂ tanks
WHMIS Controlled Products: Hazard Classes & Symbols

Class A : Compressed Gases

Storage and Transportation:
- Secure cylinder
- Store in cool ventilated area
- Transport using specialized cart
Hazard Classes & Symbols

Class A : Liquid $N_2$ & Dry Ice

Risks

- Frostbite
- Samples may explode
- Asphyxiation

Handling and Use

- Avoid skin contact
- Wear insulated gloves and eye protection
- Store in a well ventilated room
- Transport securely to prevent accidental spillage
- Store Liquid $N_2$ in a vented dewar
- DO NOT STORE DRY ICE IN WALK-IN Freezer!
WHMIS Controlled Products: Hazard Classes & Symbols

Class B: Flammable & Combustible

Six Subdivisions and examples:

1. **Flammable Gases** - hydrogen, methane

2. **Flammable liquids** [flash pt < 37.8°C] - gasoline, acetone, ether, ethanol

3. **Combustible Liquids** [flash pt > 37.8°C] - kerosene, varsol

4. **Flammable Solids** - magnesium metal, aluminum dust

5. **Flammable Aerosols** - aerosol containers

6. **Reactive Flammable Materials** - phosphorus, sodium metal
WHMIS Controlled Products: Hazard Classes & Symbols

Class B: Flammable & Combustible

Risks:
- Fire hazard - will burn if ignited
- Could ignite spontaneously
  (under adverse conditions)
- Could ignite upon mixing with water
  or other chemicals
- Many are poisonous
WHMIS Controlled Products: Hazard Classes & Symbols

Class B: Flammable & Combustible
- Store in flammable storage cabinets
- Transport securely to prevent accidental spillage
WHMIS Controlled Products: Hazard Classes & Symbols

Class C: Oxidizing Products

Risks:

- Increase fire and explosion hazard of flammable and combustibles
- Potentially explosive when mixed with flammables or organics
- Most are corrosive and poisonous
WHMIS Controlled Products: Hazard Classes & Symbols

Class C : Oxidizing Products

Examples:
Any oxygen source including:
- $O_2$ gas
- peroxides (If refrigeration required, use spark-free fridge)
- nitrates / nitrites
- chlorates / chlorites
- hypochlorites (bleach)
- perchlorates
- dichromates
- permanganates
- persulfates
When storing or handling, **ALWAYS** separate class C from class B

- At present we share the yellow flammable storage cabinets; take note/care to keep incompatible chemicals separate!
WHMIS Controlled Products: Hazard Classes & Symbols

Class D: Toxic Products

- Acute (Immediate)
- Chronic (Delayed)
- Biohazard
WHMIS Controlled Products:
Hazard Classes & Symbols

Class D: Toxic - Acute

Examples:
- All halogens (Br, Cl, F, I)
- Cyanides & nitriles (HCN)
- Heavy metals like arsenic, cadmium
- Heavy metal salts like nickel acetate
- Hydrogen Sulfide, Nitrogen dioxide
WHMIS Controlled Products: Hazard Classes & Symbols

Class D : Toxic - Chronic

Examples:
- Heavy metals like mercury & lead
- Solvents like formaldehyde, benzene, carbon tetrachloride
- Reagents like acrylamide, ethidium bromide
- Numerous carcinogens, mutagens and teratogens
WHMIS Controlled Products: Hazard Classes & Symbols

Class D : Toxic - Biohazard

Includes all Risk Group 2-4 organisms that can cause disease in humans and animals

Examples:
- Human blood, tissue and body fluids
- Animal blood, tissue and body fluids
- Tissue culture cell lines
- Experimental bacterial, viral and yeast cultures

Health Canada's "Laboratory Biosafety Guidelines"
Class E : Corrosive Products

Risks:
- Will burn human tissues including skin, eyes, mouth, throat & lungs
- Will corrode many lab related materials particularly metals
- Fumes may be environmentally damaging
WHMIS Controlled Products: Hazard Classes & Symbols

Class E : Corrosive Products

Examples:
- Most oxidizing agents
- Strong acids & bases
- Gases like hydrogen fluoride, hydrogen chloride, chlorine, bromine, sulfur dioxide
WHMIS Controlled Products: Hazard Classes & Symbols

Class F: Dangerously Reactive

Risks:
- Can react violently under certain conditions including:
  - contact with water or other chemicals
  - if heated or shaken
  - if allowed to polymerize
- Can release poisonous vapors when mixed with other chemicals
Chemical Storage

Potentially Explosive Chemicals

Picric Acid and Nitro Compounds

- Dry picric acid may explode if subjected to heat, shock, or friction (opening the lid)
- Picric acid must be stored under wet.
- Some nitro compounds may have similar requirements

Peroxide Forming Compounds

- Example ethers, dioxanes, sodium amide
- Peroxide formation may be initiated by light or air
- Peroxides are prone to explosive decomposition when subjected to heat, shock, or friction (opening the lid)

Evaluate the conditions of these chemicals regularly
WHMIS: Three Key Elements

- Education
- Labels
- Material Safety Data Sheets (MSDS)
WHMIS Labels

Workplace Labels:

1. Product Name

2. MSDS Reference

3. Safe Handling Instructions
WHMIS Labels

Labels Must be in English on:
- aliquots from an original container
- product where original label is lost or illegible
- products produced and used at the workplace

Workplace labels available via UofM EHSO office – or printed from the website. Stocks are available in the folders.
WHMIS: Three Key Elements

- Education
- Labels
- *Material Safety Data Sheets (MSDS)*
WHMIS MSDS: Material Safety Data Sheet

- Detailed information about the controlled product.
- **Must be provided by the supplier.**
- **It is against the law to use a controlled product in the workplace without the presence of an MSDS.**
- **Must be no more than three years old from the date produced or revised.**
- **If you have synthesized a product, you must prepare an MSDS.**
- **Risk Group 2 and higher biological agents also require an MSDS (i.e., Pertussis toxin, Leishmania spp., etc).**
WHMIS MSDS:
Know the location of your MSDS collection - *(Main Entrance beside first aid kit)*
Manitoba Work-place Health Hazard Regulation requires that a chemical inventory be maintained of all controlled products in the workplace.

Every PI’s Online Inventory Database needs to be updated!!
Chemical Storage

Cabinets under Fume Hoods labeled for different chemicals:

Acids
Bases
Extremely hazardous

LMC to discuss coordinating orders of acids/bases/flammables (ie. 5-4L jugs of xylene/methanol TOO MANY!)

Every PI's Online Inventory Database needs to be updated (location, volumes)
WHMIS: Chemical Waste Disposal
Back to you Sam....
Lab Specific Safety Programs

- Biological
Biological Containment Standards

Major Resources

• Laboratory Biosafety Guidelines 3rd Edition
• Containment Standards for Veterinary Facilities
• Occupational Health and Safety in the Care and Use of Research Animals.
Biosafety Level 2

Risk groups 1, 2
Biological Agent Risk Groups

Risk Group 1

- Poses no special hazard and should not affect a healthy person or animal in any negative way. Example: E. coli gene expression host.
Biological Agent Risk Groups

Risk Group 2

- Pathogens that can infect humans and animals but the infection is not serious, it is self resolving or treatable and should not spread. Example: Campylobacter jejuni or Salmonella spp.
Class II Biological Safety Cabinets

- Air flow is in two directions.
- User and product protection
- Type A 70% of air is recirculated
- May vent into the lab
- May be thimble or soft ducted exhaust to outside
Personal Protective Equipment

Protect the:

- Eyes
- Face
- Respiratory tract
- Body
- Hands
- Feet

Face Protection

- Face shield
- Googles
Protect the Body

- Lab coat
- Back fastening gown
- Greens
- Paper coveralls (bunny suit)
- Positive pressure Blue Suit

http://www.cihr-irsc.gc.ca/images/a.jpg
Protect the Hands

Gloves

- Disposable vinyl, nitrile, latex for protection from LAA’s and low exposure to chemicals
- Sterile disposable for good mouse work
- Heavy rubber chemical protection
Protect the Feet and Legs

- Shoes with closed toe and heel.
- Pants
- Intent is to provide some barrier your skin and splashes or falling sharps
Hygiene

• Wash your hands (soft soap best)

• Food/beverages not allowed in laboratory spaces, carts, storage rooms including:
  • Gum
  • Water bottles, coffee cups
  • Food evidence in garbage containers
Post Exposure

- General protocol – there is a standard EHSO version
- Human blood and body fluids protocol – there is a standard EHSO version
- A project specific post exposure protocol may be needed for work with exotic agents
Biosafety:
Biological Waste Handling
# Biohazardous Waste Disposal Guidelines

This Waste chart is intended for reference for the disposal of items contaminated ONLY with Biohazardous materials.  
(see U of M "Biosafety Guide" for definition and details or consult EHSO 474-6633)

All Biohazardous Waste must be appropriately Decontaminated/Treated before disposal.  
"MATERIAL WITH RADIOACTIVE OR CHEMICAL RESIDUES SHOULD NOT BE AUTOCLAVED."  
Contact the Environmental Health and Safety Office (474-6633) before generating mixed waste items  
i.e. contaminated with biological and radioactive or chemical residues.

## Items To Be Disposed

<table>
<thead>
<tr>
<th>Solids</th>
<th>Collection Method</th>
<th>Decontamination</th>
<th>Final Destination</th>
</tr>
</thead>
<tbody>
<tr>
<td>e.g. Petri Dishes,</td>
<td>For Items with Biological contamination Only.</td>
<td>Autoclave Minimum 1 Hr @ 121°C, Add Autoclave</td>
<td>-Remove Biohazard Logo Tape after autoclaving,</td>
</tr>
<tr>
<td>Plastic Culture</td>
<td></td>
<td>Tape to bag as indication of decontamination</td>
<td>-Place in Dark Garbage Bags,</td>
</tr>
<tr>
<td>dishes, bench paper,</td>
<td></td>
<td>status</td>
<td>-Dispose of with Caretakers.</td>
</tr>
<tr>
<td>gloves, etc.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Biomedical Sharps    | Dispose of into a rigid, puncture resistant, container with a secure lid. Label  | none                                                                 | -Give to EHSO Hazardous Waste Coordinator for disposal |
| e.g. All Needles,    | the hazard appropriately.                                                         |                                               |                                                        |
| Syringes, Scaife or  |                                                                                   |                                               |                                                        |
| Razor blades         |                                                                                   |                                               |                                                        |

| Glass and other      | Dispose of into an Approved, Autoclavable Appropriately Labeled Sharps Container  | -Add Autoclave Tape to container as indication of decontamination status – Autoclave Minimum 1 Hr @ 121°C |
| sharps with the      | Do NOT fill to more than 1/3 of the total volume.                                 |                                               | -Label with Biosafety Permit & Initial                 |
| potential of         |                                                                                   |                                               | -Give to EHSO Hazardous Waste Coordinator for disposal |
| puncturing skin e.g. |                                                                                   |                                               |                                                        |
| microscope slides,   |                                                                                   |                                               |                                                        |
| glass Pasteur pipettes, rigid plastic pipelette tips,            |                                                                                   |                                               |                                                        |

| Other Biological     | -Collect in a reusable rigid puncture resistant autoclavable container, Label   | -Autoclave 1 Hr @-121°C, Remove Biohazard     | -Package in plastic bag lined sturdy cardboard box,   |
| Contamination Only   | with Biological and cell cultures                                                 | Logo Tape                                    | -Seal well                                            |
| e.g. Microbiological |                                                                                   | -or-                                          | -Label as "Broken Glass"                              |
| and cell cultures    |                                                                                   | -Decontaminate with a proven chemical method | -Dispose of with Caretakers                           |

| Liquids              | Biological contamination Only (no chemical or radioactive hazards)                | Autoclave as appropriate for volume or       | Dispose to sewer with copious amounts of water         |
|                      |                                                                                   | decontaminate with a proven chemical method   |                                                        |

| Pathological Waste   | Consult with Radiation Safety Manual, Central Animal Care Services/Manual and     | Disposal to Sewer with copious amounts of     |                                                        |
| e.g. Animal Carcasses | your department for any special directives.                                       | water                                        |                                                        |
|                      |                                                                                   |                                               |                                                        |

For Exceptions or Clarifications please call  
Dr. Prabhat Goswami-474-6633 or Evelyn Froese-780-3477

Dec 2001
Common Types of Biological Waste

- Solids – sample tubes, gloves, gowns, and other non-sharps
- Liquids - wet stuff
- Sharps – needles, used glassware, pipettes, and pipette tips
- Carcasses and tissues
Biological Solid Waste Disposal

- Place in **clear** autoclave bag
- Mark with autoclave tape plus biohazard symbol
- Autoclave for 1 hour at 121°C **minimum**
- This is appropriate **only** when radioisotopes and hazardous chemicals are absent
- EHSO can assist with risk assessments
Biological Liquid Waste Disposal

- Package in a leak proof autoclave container (stainless steel, polypropylene or Pyrex glass).
- Mark with autoclave tape and biohazard symbol
- Don’t over fill and leave the cap loose
- Autoclave at 121°C for 60 minutes minimum or 60 minutes/gallon whichever is greater
- Remove or deface biohazard logo afterwards
- After decontamination you can drain dispose, dilute with water and flush down the drain with copious amounts of water
Biological Liquid Waste Disposal

- For materials which are unsafe for autoclaving like radioactive materials or hazardous chemicals
- Chemical decontamination is useful
- Bleach may work but at a higher concentration
- **Decontamination is not instant**, there are exposure times required
Biologically Contaminated Sharps

- Collect in an approved biohazardous sharps container only
- Mark with autoclave tape
- Autoclave at 121°C for 1 hour minimum
- Label with waste tag and dispose of through EHSO
Proper Sharps Disposal

- Approved Container
- No Hand Re-Capping
Don’t Overfill

Overfilled Biohazardous Sharps Container
General Lab Safety Waste Disposal Procedures

General Guidelines

- Segregate **Biological** from **Chemical** waste at source.
- **NO sink disposal of chemicals** (with limited exceptions as per U of M waste disposal chart)
- **Use clear autoclave bags for biological hazardous waste**
Biosafety:
Disinfection and Decontamination
Disinfection vs. Sterilization

What’s the difference?
Disinfection vs. Sterilization

- **Disinfection**
  - Reduction in the number of microorganisms in or on an inanimate matrix to an acceptable level

- **Sterilization**
  - Complete destruction of all living or viable organisms with a probability of one in one million that any viable agents remain. (p=1/1x10^6)
Common Types of Disinfectants

- Bleach (Halogen)
- Alcohol
- Clidox (Chlorine dioxide)
- Virkon (Oxidizers)
- Iodine (Iodophores)
Bleach

- Active ingredient: Hypochlorous acid (HOCl)
- Best pH 7.5
- 20-30 minute exposure time
- Good broad spectrum activity

Mix and use FRESH!!!
How to use Bleach

- 1:5 effective for biohazardous spill clean up.
- 1:10 effective surface decontaminant (if surface can stand it).
- 1:20 general disinfectant (Clorox label)
- 1:100 commonly used for routine wipe down of surfaces.

Notes:
- At pH below 7 activity is quickly compromised.
- Breaks down in the presence of organic material
- Breaks down in light and with some metals so avoid in storage
Bleach – DANGER!

- Addition of acid to bleach releases chlorine gas!
How to use Alcohol

- Active form: 70% vol/vol ethanol or isopropanol
- Best when wiped on and left wet
- Great skin disinfectant
- 24 hour contact time for surgical instruments

Note:
- Evaporation causes dilution and decreased effectiveness
Alcohol -DANGER

- Flammable! Avoid spark and flame especially in Biosafety cabinet!
Autoclave Sterilization

- Uses heated moist air (steam)
- Most efficient transfer of heat
- Will break H-bonds,
- Causes coagulation and denaturation of proteins and nucleic acids
Autoclave Safety

Dangers

- Heat
- Steam
- Pressure
Autoclave Safety

Safer practices

• **Do not autoclave chemicals that are flammable, explosive or that decompose with heating!** Refer to MSDS!
• Do not autoclave materials that will melt in the autoclave without secondary containment to contain the liquid
• Follow departmental procedure in using autoclave.
• Allow the autoclave to cool (10 min)
• Open the autoclave door just a crack at first to vent steam and heat
• **Do not lean into the autoclave, pull the load out to you!!!**
• Move hot loads on a cart
Autoclave Safety

Protective equipment

- Lab coat
- Thermal insulated gloves
- Safety glasses
- If the load has large volumes of liquids a rubber splash apron should be used
Lab Specific Safety Programs

- Combined Lab Inspection Program (CLIP)
Kudos to everyone in the Department

Congratulations and THANK YOU for the remarkable efforts to keep the Department of Immunology a Safe Working Place!!!
CLIP citations this year

- Secure the CO$_2$ Tanks.
- WHIMS labels
- Worn-out electrical wirings
Needs Improvements:

- Body protection

- Prompt Removal of autoclaved bags from the autoclave after use.

- Prompt removal of the chemical or sharp wastes – do not accumulate.
THANK YOU