Some chemicals alter DNA, which can lead to cancer if your body does not correct the damage.

Your risk for developing cancer increases with increased frequency of exposure to carcinogens. Exposure prevention is best.
Who Identifies & Classifies Carcinogens?

1. The International Agency for Research on Cancer (IARC); &

2. The Department of Health and Human Services National Toxicology Program (NTP)

IARC and NTP carcinogen classifications can be found:

1. On Safety Data Sheets (SDS)
2. Online by accessing NTP Annual Report on Carcinogens
3. Online by accessing IARC Monographs on the Evaluation of Carcinogenic Risks to Humans

Note: IARC and NTP carcinogen classifications are recognized by OSHA.
### IARC Classifications

<table>
<thead>
<tr>
<th>Group</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>Carcinogenic to humans</td>
</tr>
<tr>
<td>Group 2A</td>
<td>Probably carcinogenic to humans</td>
</tr>
<tr>
<td>Group 2B</td>
<td>Possibly carcinogenic to humans</td>
</tr>
<tr>
<td>Group 3</td>
<td>Unclassifiable</td>
</tr>
<tr>
<td>Group 4</td>
<td>Probably not carcinogenic</td>
</tr>
</tbody>
</table>

### NTP Classifications

<table>
<thead>
<tr>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known to be carcinogenic</td>
</tr>
<tr>
<td>Reasonably anticipated to be carcinogenic</td>
</tr>
</tbody>
</table>

### Key

- **OSHA** refers to these substances as “select” carcinogens if there is statistically significant tumor incidence in experimental animals.
ACGIH Classification

Other meaningful classifications are provided by the American Conference of Governmental Industrial Hygienists (ACGIH), and can commonly be found on Safety Data Sheets (SDS):

**ACGIH**

A1 - Confirmed human carcinogen
A2 - Suspect human carcinogen
A3 - Confirmed animal carcinogen with unknown relevance to humans
A4 - Not classifiable as a human carcinogen
A5 - Not suspected as a human carcinogen

OSHA refers to these substances as “select” carcinogens

The American Conference of Governmental Industrial Hygienists (ACGIH) bases their classification upon information such as that provided by IARC and the NTP.
The following signal word and hazard statement will be found on SDS's that pertain to “select” carcinogens:

Signal Word: Danger

Hazard Statement: May be fatal if swallowed and enters airways. Causes skin irritation. May cause drowsiness or dizziness. May cause genetic defects. May cause cancer. Suspected of damaging fertility of the unborn child. Toxic to aquatic life with long lasting effects. Highly flammable liquid and vapor.

An SDS might also include:

Chronic Effects and Carcinogenicity

Carcinogenicity: OSHA: Yes  IARC: (1)  NTP: Yes  ACGIH: (A1)

Note: by the end of 2015 chemicals will be shipped with an SDS, rather than an MSDS, and be labeled in a manner consistent with their SDS.
Use of “Select” Carcinogens

If you must use a “select” carcinogen then measures must be taken to ensure all exposures are kept to the lowest practical level.

This not only applies to lab workers but also individuals like custodians, security personnel, utility workers, and others who may enter the work area.
Controlling Exposures

When exposures can't be eliminated, they must be controlled using various means. Some control measures are preferred above others due to effectiveness and the degree of human interaction required for the control to work properly.

Hierarchy of Controls

- **Engineering controls** (e.g. *Glove Box*)
- **Administrative controls** (e.g. Work practices)
- **Personal protective equipment** (e.g. Respirator)

It is common for there to be a need to implement a combination of control measures.
Designated Areas

Use carcinogens only in areas designated for such use. A designated area is determined by the supervisor of those performing the work.

Doing so in conjunction with proper signage will help protect individuals like custodians, security personnel, utility workers, and others who may enter the laboratory.

A sign template is provided at the end of this presentation.
OSHA Requirements

Requirements for all “Select” Carcinogens

1. Written procedures detailing how to properly use the substance(s) and how exposures will be controlled.
2. Strict hygiene procedures.
3. Secured Access - Designated areas are only accessed by authorized persons.
4. Training.

Consult with Risk Management (422-4468) or the college Health & Safety Officer (422-6589) if you have any questions.
OSHA Requirements for the following 13 Carcinogens

- **OSHA’s 13 Carcinogens**
  2- Acetylaminofluorene
  3, 3’- Dichlorobenzidine (and its salts)
  4- Aminodiphenyl
  4- Dimethylaminoazo- benzene
  4- Nitrobiphenyl
  Alpha- Naphthylamine
  Benzidine
  Beta- Naphthylamine
  Beta- Propiolactone
  Bis- Chloromethyl ether
  Ethyleneimine
  Methyl- Chloromethyl ether
  N- Nitrosodimethylamine

1. **Use of the substance must be in an isolated or a closed system (e.g. glove box)**

2. **Use adequate local exhaust ventilation (e.g. lab hood) when opening a closed system to transfer the substance. Full body protection must be worn while performing the transfer. And, before leaving the designated area following transfer of the carcinogen all clothing must be removed and placed in designated laundry collection containers and individuals must wash their bodies using designated washing facilities provided by the employer.**

3. **Spills or leaks must be addressed while wearing impervious full body protection; and individuals must decontaminate in a manner similar to item 2 above before leaving a designated area.**

4. **Reports are to be submitted to the OSHA office.**

5. **Medical surveillance must be performed.**

Please consider using a different chemical or not performing the work if one of the 13-carcinogens would otherwise be used.
Other Substance Specific OSHA Requirements

**Requirements for:**
- Asbestos
- Inorganic Arsenic
- Benzene
- 1,3-Butadiene
- Cadmium
- Ethylene Oxide
- Formaldehyde
- Vinyl Chloride

1. Exposure characterization (e.g. air monitoring and identifying tasks where exposures are high)
2. Inclusion in the University respiratory protection program if exposures warrant such.
3. Medical surveillance when exposures warrant such.
4. Change rooms for individuals whose clothing may become contaminated.
5. A shower facility in the designated area for routine wash down of individuals who work with arsenic, lead, or cadmium if exposures exceed an action level.
6. Recordkeeping (e.g. air monitoring & medical surveillance records)
Dispose of paper towels, gloves, rags, containers, or any other items contaminated with a carcinogen according to Hazardous Materials Management (801-422-6156) recommendations.
DESIGNATED AREA

☐ Explosive/Implosive Conditions
☐ Use of Select Carcinogens
☐ Reproductive Toxins
☐ Highly Toxic Chemicals

(Check those that apply)

Authorized Personnel Only