Decontamination of your work area protects you and the environment, and even your experiments!

Do you know how to pick the right method for your work?

**Sterilization:** chemical or physical process by which all microorganisms are killed, including bacterial endospores

**Disinfection:** chemical or physical process by which nearly all microorganisms, but not all forms (spores), are killed on inanimate objects

**Antisepsis:** process by which nearly all microorganisms, but not all forms (spores), are killed on skin or living tissue

**Sanitation:** process by which contaminating microorganisms on inanimate objects are reduced to a safe level

**Germicide:** chemical agent capable of killing microorganisms, but not all forms (spores)

**Sporicide:** a germicide capable of killing bacterial spores
Decontamination in the lab is achieved by:

**Sterilization** (decon of equipment, biohazardous waste):
- Chemical Agents
- Steam autoclave
- Dry heat
- Vapors/gases
- Radiation

**Disinfection** (decon of work surfaces):
- Chemical Agents
  - Aldehydes
  - Halogen-based
  - Phenolics
  - Acids/Alkalis
  - Alcohols
  - Iodophores
  - Quaternary Ammonium Compounds

Check expirations! They count!

Remember chemical safety when handling disinfectants!

Lab decontamination is required for ALL biohazards, including rDNA

Amount of organic matter present will affect disinfectant activity

Contact time is critical to the effectiveness of the disinfectants

Make sure your disinfectant is registered with the EPA (read label)
## Common Chemicals used for Decontamination:

<table>
<thead>
<tr>
<th>Procedure/Product</th>
<th>Aqueous Concentration</th>
<th>Activity Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sterilization:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>glutaraldehyde</td>
<td>variable</td>
<td></td>
</tr>
<tr>
<td>hydrogen peroxide</td>
<td>6-30%</td>
<td></td>
</tr>
<tr>
<td>chlorine dioxide</td>
<td>variable</td>
<td></td>
</tr>
<tr>
<td><strong>Disinfection:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>glutaraldehyde</td>
<td>2%</td>
<td>High to intermediate</td>
</tr>
<tr>
<td>hydrogen peroxide</td>
<td>3-6%</td>
<td>High to intermediate</td>
</tr>
<tr>
<td>chlorine dioxide</td>
<td>variable</td>
<td>high</td>
</tr>
<tr>
<td>sodium hypochlorite</td>
<td>5,000-20,000ppm Chlorine</td>
<td>intermediate</td>
</tr>
<tr>
<td>alcohols (ethyl, isopropyl)</td>
<td>70%</td>
<td>intermediate</td>
</tr>
<tr>
<td>iodophors (wescodyne)</td>
<td>0.1-0.2%</td>
<td>Intermediate to low</td>
</tr>
<tr>
<td>quaternary ammonium compounds</td>
<td></td>
<td>low</td>
</tr>
</tbody>
</table>

### Bleach Fast Facts:

Household bleach is 5.25% sodium hypochlorite; therefore:
- 1:2.5 dilution = 2.1% = 21,000ppm Cl⁻
- 1:5.0 dilution = 1.05% = 10,500ppm Cl⁻
- 1:10 dilution = 0.525% = 5,250ppm Cl⁻

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Did you know... 1:10 bleach is only stable for 24hrs?
Classification and Effectiveness of Disinfectants

Disinfectant Level
- High
- Intermediate
- Low

Efficacy
- Most Germicidal Resistant
- Least Germicidal Resistant

Disinfectants:
- High:
  - B. subtilis, C. sporogenes
  - Mycobacteria (M. tuberculosis)
  - Non-lipid viruses (Poliovirus, Rhinovirus)
  - Fungi (Candida spp., Cryptococcus spp.)
  - Vegetative bacteria (P. aeruginosa, S. aureus)
  - Lipid viruses (HSV, RSV, HBV, HCV, HIV)

EHS Biosafety Program
http://www.dartmouth.edu/~ehs/biological/
603-646-9790
Thanks for reading!

HAVE QUESTIONS?
OTHER BIOSAFETY TIP IDEAS?

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