1. Biological Safety Cabinet Operation

- Biological safety cabinets (BSCs) are a central piece of equipment in a research laboratory and are used for primary containment while working with infectious agents.

- Biological safety cabinets provide protection in 3 ways.
  1. PERSONAL protection from infectious agents used inside the cabinet
  2. SAMPLE protection from contamination
  3. LABORATORY ENVIRONMENT protection from contaminants within the cabinet

- Air curtain along with sash provide protection to personnel working in a laboratory.

- All air processed in a BSC is High Efficiency Particulate Air (HEPA) filtered meaning 99.97% of contaminants at 0.3 microns in size or larger are captured.

- Class II, Type A2 or Type A/B3 are the most common BSCs in laboratories. These cabinets provide 70% recirculated air and 30% exhausted air. Biological agents and minute quantities of chemical agents can be used in these BSCs.

- Class II, Type B2 BSCs provide 100% exhausted air. Biological agents and volatile or unknown chemicals can be used in these BSCs.
2. Biological Safety Cabinet Decontamination

- Biological Safety Cabinets are required to be decontaminated following the use of any potential infectious agents.

- Disinfectant selection should have 2 informational items listed on the label.
  1. EPA Registration Number
  2. Listing of infectious agents that the disinfectant is effective against

- The following are examples of approved EPA-Registered Disinfectants:

- Disinfectants should be listed on the following EPA Registered Antimicrobial Products lists when following BSL-2 or BSL-2+ work practices:

  US Environmental Protection Agency Office of Pesticide Programs
  List D: EPA’s Registered Antimicrobial Products Effective Against Human HIV-1 and Hepatitis B Virus
  http://www.epa.gov/oppad001/list_d_hepatitisbhiv.pdf

  List E: EPA’s Registered Antimicrobial Products Effective Against Mycobacterium tuberculosis, Human HIV-1 and Hepatitis B Virus
  http://www.epa.gov/oppad001/list_e_mycobact_hiv_hepatitis.pdf

  List F: EPA’s Registered Antimicrobial Products Effective Against Hepatitis C Virus
  http://www.epa.gov/oppad001/list_f_hepatitisC.pdf

- Biological Safety Cabinets are not permitted to be decontaminated with ONLY ethanol if BSL-2 or BSL-2+ agents are in use (ethanol evaporates and does not remain on the surface of the BSC long enough to provide the necessary contact time to inactivate agents). Ethanol should be used as a rinsing agent after disinfection with bleach or another EPA-Registered disinfectant.

- Ultraviolet light must not be used as the only method of disinfection of any BSC.

- Biological Safety Cabinets are required to be certified by an approved third party vendor on an annual basis.

- Third party vendor is required to decontaminate biological safety cabinets prior to repairs or relocation of the BSC in a new laboratory or an existing laboratory space.

- Biological Safety Cabinets are required to be certified by an approved third party vendor after repairs to the BSC or after the BSC has been moved.

A Start to Finish Reference Guide

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<th>Working in the Cabinet</th>
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<tr>
<td>Keep supplies such as additional gloves, culture plates, flasks, and culture media outside BSC</td>
<td>Implement aseptic techniques at all times</td>
<td>Seal contaminated containers</td>
</tr>
<tr>
<td>Limit foot traffic near the BSC</td>
<td>Enter and exit smoothly and deliberately; arms at right angles to cabinet</td>
<td>Decontaminate all outside surfaces of materials before they are brought out of the cabinet</td>
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<tr>
<td>Keep doors and windows closed</td>
<td>Work in the center of the cabinet</td>
<td>Remove all items from the cabinet</td>
</tr>
<tr>
<td>Adjust seat height</td>
<td>Do not use open flames in a BSC</td>
<td>Disinfect the BSC work surfaces with an EPA-registered disinfectant</td>
</tr>
<tr>
<td>Operate blowers at least 4 minutes prior to beginning work to eliminate suspended particulate matter</td>
<td>Clean up spills in BSC immediately using appropriate disinfectant</td>
<td>Properly dispose of all solid biological wastes according to University Guidelines</td>
</tr>
<tr>
<td>Utilize proper PPE (i.e. lab coat, gloves, other PPE if required)</td>
<td>Keep materials in the BSC to a minimum</td>
<td>Properly dispose of all liquid biological wastes after appropriate contact time with disinfectant</td>
</tr>
<tr>
<td>Wipe or spray 10% bleach (or an approved disinfectant) to the work surface and interior walls of the BSC; avoid the supply filter diffuser</td>
<td>Do not block air grate in the front or back of the BSC</td>
<td>If cabinet is left running, leave view screen sash at half height</td>
</tr>
<tr>
<td>If applying bleach, follow with a 70% ethanol rinse and then a sterile water rinse to remove residual chlorine</td>
<td>Foot traffic should be kept to a minimum behind anyone working at a BSC</td>
<td>If cabinet is turned off, close the view screen</td>
</tr>
<tr>
<td>Plastic-backed absorbent toweling can be placed on the work surface; avoid covering the front or rear grille openings</td>
<td>Confirm proper operation of the biological safety cabinet by the reading on the pressure gauge before and during working in the BSC</td>
<td>If UV lights are used, make sure no one is in the room, close the view screen, turn on the lights and leave</td>
</tr>
<tr>
<td>Place all materials as far back in the cabinet as possible especially aerosol generating equipment</td>
<td>BSC height of work surface should be 28 to 34 inches from the floor with a minimum knee clearance of 27 inches</td>
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