## Top Safety/Practical Issues with Class II type A2 Biological Safety Cabinets (BSCs): These BSCs have been newly designated type A2, and they take in air from the room and return it back into the room. The BSC may be, but usually is not ducted.

- 1. BSCs need to be certified annually (as well as when they are moved or installed) if they are used for protection against infectious substances.
- 2. Horizontal and vertical laminar flow clean benches (illustrated in the BMBL) do not protect workers from hazardous substances and are not interchangeable with BSCs.
- 3. BSCs can actually contribute to contamination of cultures if they are not cleaned periodically, including removing the work surface and cleaning the space below it. **IMPORTANT**: If your BSC has been used with infectious agents, consider carefully whether or not the BSC needs disinfecting and what protective equipment should be worn before it is taken apart. You may wish to consult with the BSO.
- 4. Using a Bunson or Fisher burner in a BSC actually disrupts the protective airflow inside a BSC. The burners create updrafts while the BSC is blowing downward on the work surface. Instead of these burners use a burner with a push pad that lights from a pilot light, or a small electric furnace to sterilize inoculating loops. Currently, it's standard practice not to flame things while performing tissue culture inside a clean BSC. Be careful that the flame is off before disinfecting with 70% alcohol.
- 5. Covering the air inlet grills, at the front of the work surface and at the back of the work surface (or lower back wall), of the the BSC with equipment, pads, and/or supplies, can disrupt the proper air flow of the BSC and allow contaminants to escape into the breathing zone of the operator. The grills should remain unobstructed during use.
- 6. Turbulence near the opening of the BSC, such as someone quickly walking by, quick sweeping arm movements by the operator, or the air current from the ventilation register, can cause contaminated air inside the BSC to come out the opening and into the operator's breathing zone.
- 7. Toxic gases, volatile chemicals and radioactive materials must not be used in the unducted Class II type A2 BSC. This kind of BSC removes only particulates; volatiles in the exhaust are released back into the room and may then be inhaled by the occupants of the room. Further, the majority of air (70%) is filtered and recirculated back to the work surface of the BSC, which can actually concentrate the volatile. If the volatile is flammable, this can become a fire hazard. There are Class II BSCs that one can use volatile chemicals in and are protective (with respect to both infectious substances and volatiles) to the occupants of the room. In all of these types (A2 ducted [previously B3], B1 and B2), the BSC exhaust is ducted out of the room. Only in the Class II type B2 BSC can one use relatively the highest amounts of volatiles, because 100% of the exhaust is ducted directly to the outside.
- 8. Ultraviolet lamps inside BSCs must be cleaned and replaced regularly in order to be effective. They have varying effectiveness on infectious organisms and don't shine under the work surface where a lot of contaminating material often accumulates. They may be more trouble than they are worth.
- 9. At some point, the HEPA filters in the BSC will need to be changed. In order to do this, the BSC and preferably the room where it stands must be unoccupied for up to 2 days. The BSC is enveloped in plastic and decontaminated with formaldehyde vapor by cooking paraformaldehyde and water. Then, the formaldehyde is deactivated with Ammonium bicarbonate. This process inactivates infectious materials, but not necessarily hazardous chemicals. The decontamination process is a hazardous process, particularly if there is a leak in the envelope that allows formaldehyde to escape. The sub contractors who perform this wear respirators in case of a leak. It is better if no one else is working in the same room during this process. At this point the filters are removed and new filters installed. Then the BSC is recertified (proof of airflow and lack of leaks). Please notify Research Safety (x2723) in advance if you are having this service performed.
- 10. A good all-around surface disinfectant is 10% bleach with a 1minute exposure time. This can be followed with an alcohol wipe down. Ten percent bleach should be made fresh daily in clinical labs. In research labs, less often may be allowable. Alcohol alone may not be effective for all contaminants as it may evaporate before an effective exposure time is reached. Wescodyne is a good surface disinfectant although it leaves a reddish film. This can act as a disinfectant for droplets and as a visual indicator of small spills.