

Safetygram

NCI Frederick

ISM-206

General

September 2010

Using UV Lamps in Biological Safety Cabinets

Many biological safety cabinets (BSCs) are equipped with ultraviolet (UV) lights. However, if best laboratory practices and procedures are followed with regard to decontamination and disinfection, UV lights need not be used for germicidal applications. UV radiation should not be used in biocontainment laboratories to replace or supplement proper decontamination and disinfection procedures. In addition to using aseptic technique and setting up materials and waste containers properly, BSCs should be decontaminated at least daily and/or immediately following use with an EPA-approved disinfectant. If UV lamps are installed on BSCs, make yourself aware of their proper use, maintenance, limitations and safety hazards. The NIH does not recommend or support the use of UV radiation in laboratories or BSCs. Although the application of UV radiation in varying doses may be effective against reducing bioburden with respect to different microbes, UV radiation has several limitations and restrictions. The 253.7 nm wavelength emitted by the germicidal lamp has limited penetrating power and is primarily effective against unprotected microbes on exposed surfaces or in the air. UV light does not penetrate soil or dust. The intensity or destructive power of UV light decreases by the square of the distance from the lamp. Thus, exposure time is always related to the distance. The effectiveness of the lamp is drastically affected by the accumulation of dust and dirt collecting on the bulb itself. The bulbs require frequent maintenance, regularly checking of light output and possibly validating efficacy. In addition, there are safety hazards associated with the use of UV lights that require the implementation of personal protective equipment and/or other safety devices to protect users from UV over-exposures and burns. Prior to performing maintenance or monitoring activities for UV lights, the BSC must be decontaminated to assure safety for the maintenance provider.

Implementing best laboratory practices and procedures in conducting experiments within BSCs is the first step to preventing contamination. The use of UV radiation in a germicidal application cannot ensure adequate and effective decontamination of work materials and surfaces and therefore, should not be used as a means of decontamination.

Practical ways to eliminate exposures include the following:

1. The UV lamp should never be on while an operator is working in the cabinet, as exposure to UV light can cause painful burns to the eyes and skin.
2. UV lamps should be turned off while the room is occupied.
3. The fan should be off, and the sash closed when the UV light is on.
4. Be aware that UV lights can cause gas and vacuum line tubing to deteriorate and present a gas leak hazard.
5. Due to mercury content, UV lights must be disposed of as hazardous waste.

6. New BSC purchases including UV light options must include safety interlocks to prevent the use of a UV lamp while the operator is working inside the cabinet in addition to UV protective glass.
7. BCS's equipped with UV lights must have a sign posted to indicate the presence of UV light hazards.

Call EHS at x1451 if you have any questions about UV lamps, best laboratory practices and procedures, or decontamination methods.