



Bio Basics Fact Sheet: UV Radiation Protection in Laboratories

Introduction:

Biological research labs use various sources of UV radiation that may present an exposure risk. Unshielded exposure to UV radiation can damage eyes and skin. Proper training and use of protective equipment is needed to prevent accidental exposure from occurring.



Health Effects:

- Exposure to UV light can burn the retina or irritate the cornea and the conjunctiva. This can cause a feeling of "sand in the eye" and heightened sensitivity to light. Symptoms appear from 6 to 24 hours after exposure and usually disappear within 48 hours.
- Persons who have had the lens of an eye removed (e.g. cataract surgery) can receive permanent retinal damage from UV exposure - including blindness.
- Individuals who are exposed to photosensitizing agents (e.g. some oral drugs or topically applied creams) may not be aware of heightened sensitivity to UV radiation.
- UV radiation burns skin promoting skin aging and cancer.

UV Radiation Sources:

- Transilluminators
- UV germicidal lamps
- Hand-held UV units
- Crosslinkers

Safety Procedures:

- Written Standard Operating Procedures (SOPs)
 - Determine appropriate precautions/procedures for using specific UV sources. Follow manufacturer recommendations.
 - Include precautions/procedures in a written SOP for UV source use and for entering a room with UV sources in use.
 - Use SOP for training.
- Training
 - Don't assume that everyone in the lab knows the importance of UV protection or how to protect themselves from laboratory UV sources.
 - If UV sources are present in the lab, or are used elsewhere by lab staff, UV safety training should be included in new employee training and in annual lab

safety update training.

- Labeling
 - Sources of UV lights should be labeled with a warning.
 - Warning should indicate that; there is a UV radiation hazard, shielding should be in place when operating the equipment, and eye/skin protection is needed for operation.
- Personal Protective Equipment
 - All skin should be protected including face, neck, hands, and arms.
 - Wear gloves and long sleeves covering all skin above the gloves.
 - Face shields should be designed to shield against the UV wavelengths used. Radiation can readily reach the eyes through the open sides of standard eye glasses.



Note: Not all shields protect against UV, be sure that the shield is specified by the manufacturer as providing protection at the wavelength(s) used.

Good Work Practices:

- Transilluminators and hand-held UV units should be used with protective shields in place per the manufacture's instructions. Shields should be checked regularly for cracks or other damage.
- Crosslinkers should not be used if the door's safety interlocking mechanism is not working properly.
- Do not remove face shield to get a closer look at material being visualized with transilluminator or hand-held unit.
- Access to rooms with transilluminators should be controlled and posted with a warning sign indicating face and other skin protection is needed to enter when transilluminator is in use.
- UV lamps in Biological Safety Cabinets (tissue culture hoods) should not be used when the room is occupied.

Note: The use of UV lights is not required in Biological Safety Cabinets and have limited utility. See the Biological Safety Cabinet page on the DEHS web site, http://www.dehs.umn.edu/bio_pracprin_biosafecab_uv.htm.

References:

American Biological Safety Association (ABSA) Position Paper on the Use of Ultraviolet Lights in Biological Safety Cabinets

[American Industrial Hygiene Association](#), Fairfax , VA

National Cancer Institute at Frederick

Ultraviolet Radiation Exposure from UV-Transilluminators, Farhang Akbar-Khanzadeh and Mahdi Jahangir-Blourchian *Journal of Occupational and Environmental Hygiene*, 2: 493-496, 2005