- Never use a transilluminator without the protective shield in place. Keep shields clean and replace when damaged.
- Never use crosslinkers if the door safety interlock is not working properly.
- Follow manufacturer's instructions for maintenance and servicing.
- Develop and follow standard operating procedures.

Label / Signage

UV sources must be conspicuously labeled with an appropriate caution or warning notice attached to the housing of the source:

"CAUTION – UV RADIATION HAZARD, USE ONLY WITH SHIELDING IN PLACE, PROTECT EYES AND SKIN FROM EXPOSURE TO UV LIGHT"

If there is a UV-generating source in the laboratory, in addition to the label, the entrance should display a laboratory sign indicating hazards (i.e., UV light, laser, etc.), PPE required to enter, and any additional information (see Laboratory Signage Program at www.ehs.wsu.edu/ labsafety.asp).

Monitoring

Although EH&S does not conduct routine monitoring for UV radiation, there are hand-held instruments to accurately measure UV radiation generated by laboratory equipment.

Getting Assistance

EH&S is available to provide training when requested. EH&S will investigate reported overexposures, conduct monitoring (if applicable), and provide recommendations to prevent reoccurrences. If you have questions regarding UV hazards, exposure limits, monitoring, PPE or UV Lasers, or need labels and signage, contact your EH&S office.

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Environmental Health and Safety

Ultraviolet Light in Laboratories

Sources and Hazards

Think Safety. Act Safely!

Ultraviolet light (UV) is non-ionizing radiation with wavelengths in air between the 180 to 400 nanometer (nm) region of the electromagnetic spectrum, just outside the visible range. There are three UV regions of concern: UV-A (315-400 nm, black-light region, lowest potential hazard), UV-B (280-315 nm, erythema region, mid to high potential hazard), and UV-C (180-280 nm, germicidal region, highest potential hazard).

UV can be associated with health effects depending on exposure duration and wavelength. Exposure to UV is typically limited to the UV-A region resulting from direct sunlight. The Earth's atmosphere shields us from the more harmful UV-C and 99% of UV-B. Laboratory workers may be using equipment capable of generating UV radiation in all three regions; therefore, workers must use the appropriate controls to prevent injury.

Common Sources of UV in Laboratories

UV generating sources in laboratories include, but are not limited to, nucleic acid transilluminators and crosslinkers, hand-held UV units, germicidal lamps in biological safety cabinets and installed on ceilings, UV light boxes, and UV lasers.

Hazards Associated with Exposure to UV

Accidental UV overexposure can injure unaware victims because UV is invisible and does not produce an immediate reaction. Symptoms of overexposure include varying degrees of skin and eye injuries.

Skin injury – exposure to UV radiation can initiate a photochemical reaction called erythema within exposed skin. Acute effects may be familiar to anyone ever having been sunburned. This "sunburn" can be quite severe and can occur as a result of only a few seconds of exposure. Chronic skin exposure to UV radiation has been linked to premature skin aging, wrinkles, and skin cancer.

Eye injury – UV radiation exposure can cause photokeratitis, a painful inflammation of the eye caused by UV radiation-induced lesions on the cornea. Symptoms include a sensation of sand in the eye that may last for days. Chronic exposures to acute high-energy UV radiation can lead to the formation of cataracts.

Exposure Limits

Washington State Department of Labor and Industries (L&I) has established limits for eye and skin exposure to UV radiation produced from arcs, gas, and vapor discharges, and incandescent sources. These limits differ from those applied to lasers and do not include solar radiation. To reduce injuries, workers must control exposures to levels below these limits.

Limiting Exposure

Never allow the skin or eyes to be exposed to UV radiation generated by laboratory equipment. To control UV exposure, properly shield the source, require the user wear appropriate personal protective equipment, and whenever possible, turn off UV-generating equipment before entering the laboratory.

Personal Protective Equipment (PPE)

For protection against UV, wear appropriate laboratory apparel, including a fully buttoned lab coat, gloves, long pants, closed-toe shoes, and cap. Prevent gaps in protective clothing that commonly occur around the neck and wrist areas. If there is any potential for the eyes and face to be exposed, proper UV shielding eye and face protection should be worn.

Special Work Practices

- Never work in a biological safety cabinet while the germicidal lamp is on. If possible, close the sash when the light is on.