**General Guidelines for Safe Use - Blender, Sonicator, and Lyophilizer**

 General Guidelines are an essential component of the University of Regina’s Health & Safety Management System. This general guideline has been created to provide a set of **Do’s & Don’ts** on how to use blenders, sonicators, and lyophilizers equipment. It is expected that the general guidelines will assist in the creation of a lab-specific Safe Operating Procedure.

 All general guidelines along with the related Safe Operating Procedures pertaining to you or your group’s activities should be kept in a location central to the work being performed and readily available to the individuals involved in the task.

The operation of blenders, sonicators, homogenziers, mixers, shaking incubators, grinders, lyophilizers, and other similar equipment can generate aerosols. The following highlights some requirements and recommendations for using these types of equipment:

* Use lab equipment and/or associated accessories specifically designed to contain aerosols.
* When necessary, operate equipment in a BSC (only if the equipment does not disrupt airflow patterns) or another primary containment enclosure.
* Allow five minute time for aerosols to settle before opening or removing the covers/ lids.
* A towel moistened with disinfectant should be placed over the top of the blender, grinder, sonicator, etc. while operating.

**Blenders**

Safety blenders should be used. Safety blenders are designed to prevent leakage from the bottom of the blender jar and to withstand sterilization by autoclaving. They also provide a cooling jacket to avoid biological inactivation.

Avoiding using a glass blender jar. If a glass jar must be used, it must be covered with a polypropylene jar to contain the glass in case of breakage.

**Sonicators**

Sonicators are high-frequency sound generators used to disrupt cells or shear nucleic acids. Laboratory personnel must be concerned about two of the major hazards associated with sonicators. The first hazard is hearing damage caused by high frequency sound. The second hazard is the generation of aerosols from the sonication process.

Sonicators generate sound waves in the 20,000 Hz range. These sonicator-generated sound waves are outside the normal range of hearing. Often the sound heard while using a sonicator is produced by cavitations of the liquid in the sample container or vibrations from loose equipment. Actions you can take to reduce the hazards include:

* Wear earphone-type sound mufflers to protect your hearing while sonicating (contact health.safety@uregina.ca)
* If possible, have the sonicator located in a "sound-proof" cabinet while sonicating
* Do not sonicate in a room containing people not wearing ear protection
* Shut doors of the room where sonication is taking place

The greatest hazard when using sonicating equipment to disrupt cells or shear nucleic acids is the creation of aerosols. These aerosols are generated by cavitations of the sonicator horn in the sample media and mechanical mixing. Cup horn sonicators allow sonication of samples within a contained vessel without direct contact with the material being processed. Sonication may be safely performed by placing a tightly capped specimen tube in a beaker of water and putting the probe in the **water**, not in the tube.

**Lyophilizers**

Lyophilizer vacuum pump exhaust should be filtered through HEPA filters or vented into a biosafety cabinet.

Polypropylene tubes should be used in place of glass ampoules for storing biohazardous material in liquid nitrogen. Glass ampoules can explode, causing eye injuries and exposure to the biohazardous material.

\*Information provided by the University of Rochester