

# Practical Biosafety for Vanderbilt Research Labs

*This periodic guide is prepared by the VEHS Biosafety Section to highlight lab safety practices related to the use of biological materials in research. Our contact information is provided at the end of this document if you need specific assistance.*

## THE “DOUBLE EDGE” OF EXPOSURE RISK: GLASS LAB DEVICES & BIOHAZARDS

A very common and efficient way to introduce a hazardous agent into one’s body is through a break in the skin. The use of glass devices and vessels in the research lab can result in punctures and cuts, thus increasing personnel exposure risk to chemical or biological hazards. (Fluid-resistant disposable gloves are not rated to be cut- or puncture-resistant.) Here are pointers for reducing the potential for injuries (and possibly hazardous exposures) sustained from handling glass:

- Minimize the use of glass in all operations to the extent possible.
- When purchasing reagents and lab supplies, consider options that are constructed of non-glass materials or have a safety coating (e.g., Teflon-coating) that will minimize the potential for breakage and creation of jagged edges.
- If you must use glass devices or vessels in your lab, do not use devices that are chipped or cracked.
- Do not handle broken glass directly with hands. Use mechanical tools such as a disposable broom and dust pan, or tongs/forceps, for retrieving broken glass.

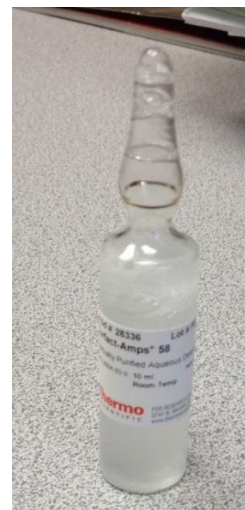


***Non-glass options are available for many of the common lab ware items shown here.***

## Biosafety Focus on Glass Ampoules

If a glass ampoule must be used, the process for opening the ampoule needs be performed in a manner that minimizes the potential for creating sharp edges and/or dispersing glass debris and ampoule contents. Simply snapping the top off of an ampoule by hand is a leading cause of sharps injuries, and it is not an appropriate practice. Safety considerations when ampoules must be used include the following:

- The ampoule should be pre-scored or scored using a tool designed specifically for that task. This will better assure a “clean” break.
- To open safely, the ampoule should be secured in such a way that it will not be held directly by hand. A variety of products are available to eliminate direct handling of ampoules during the breaking process. However, remember that the opening process can also cause breaking or cracking of the body of the ampoule. Therefore, it is strongly recommended that the body of the ampoule be secured with a device (such as a clamp or in a secure rack), not held in one’s hand during the opening process. Ampoule opening safety products can be found online by using a keyword search of “ampoule opener”, or contact the VEHS Biosafety Section for assistance.
- If you need to open an ampoule but do not have a safety device available, here are steps to ensure that this is done safely:
  - Open the ampoule inside a fume hood or BSC.
  - Wrap the top of the ampoule in an absorbent paper towel.
  - Carefully break the scored ampoule top, breaking it away from yourself.
  - Change your gloves after opening the ampoule to assure that no glass residues remain.
  - Discard ampoule pieces immediately in a sharps container. (Broken glass box may only be used if ampoule does not contain a biological and is not used in conjunction with biological agents.)

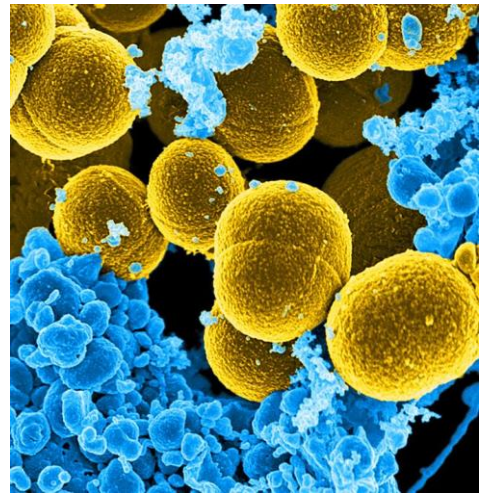


***As with other glass devices, seek alternatives to using sealed glass ampoules for your procedures to avoid injuries.***

## Pathogen Safety Data Sheets: A Great Way to “Know Your Bugs”

When planning research involving infectious agents, it is important to be well-informed about how the infectious disease is transmitted and infectious disease outcomes before you or any other lab members begin work with the agent. This knowledge will help you get the most meaningful and timely medical intervention if you acquire an infection from the lab environment.

The Public Health Agency of Canada has generated [Pathogen Safety Data Sheets](#) for agents recognized as human pathogens, and this is a great resource for building your agent knowledge. Based on the premise of a material safety data sheet, these documents succinctly outline microbiological features, signs/symptoms, infectious dose and host range, viability, and inactivation information. Other agent profile websites can also be found in the [Biosafety Section of the VEHS website](#).



All BSL-2 labs should assure that their biosafety manual includes an infectious agent profile for each infectious agent actively in use, as well as a copy of the VEHS Biosafety document entitled: [Responding to Personnel Exposures & Spills Involving Biological Materials](#). (Remember, per this document, any known or suspected biological materials exposures or spills need to be reported to the Biosafety Officer as soon as possible.) Principal Investigators should assure that all lab members are familiar with the content of these documents and refresh this information periodically in lab meetings.

## Biosafety 101: Standard Microbiological Practices (SMP) Online Course Now Available Through The Learning Exchange

At all biosafety levels, standard microbiological practices are the foundation for conducting your work in a manner that ensures safety for you and minimizes exposure and contamination risk for the environment around you. This 45-minute online course provides a basic description of biological hazards and regulated biological materials, overview of biosafety levels, and standard microbiological practices including:

- biohazardous waste segregation, handling and disposal,
- hygiene practices to enhance lab safety and minimize potential cross-contamination, and
- spill and exposure prevention practices.

This course serves as a core training for those working with biological materials and recombinant DNA that are not anticipated to be infectious to humans, animals or plants (i.e., materials that only require BSL-1 containment). However, it is now a prerequisite training for personnel who plan to complete the [Principles & Practices of Biosafety](#) course. It is also an essential informational primer for all Principal Investigators whose research involves the use of biological materials, but who do not work at the bench themselves. The description and link for accessing the Biosafety 101: SMP training can be found [here](#).

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