

WORKING SAFELY WITH CRYO- PRESERVATION VIALS

HAZARD SUMMARY

When cells or other biological specimens are stored in liquid nitrogen, the low temperatures can cause the container lid to become brittle, and liquid nitrogen may seep in. If the vial is then removed from storage, liquid nitrogen trapped inside will expand rapidly to the gas phase and is likely to cause the vial to explode, destroying the sample and possibly causing injury.

SAFETY RECOMMENDATIONS

To prevent vials from exploding when removed from cryogenic storage:

- Store standard vials only in the gaseous phase of nitrogen above the liquid. The bottom of the vial may be submerged if needed, but not the cap. Alternately, consider sample storage in mechanical cryogenic freezers—some provide freezing temperatures down to -150°C .
- If samples must be stored in liquid nitrogen, use vials designed for this. (Note that some liquid nitrogen storage vials require heat sealing, which may damage some samples.)
- For existing samples that have been stored in liquid nitrogen, follow these precautions when retrieving:
 - ⇒ Wear personal protective equipment (PPE) when retrieving samples from liquid nitrogen. PPE should include splash goggles, face shield, cryo gloves, and lab coat.
 - ⇒ Raise the vials out of the liquid phase and store them in the gas phase (above the liquid) for at least 24 hours. During this time, the trapped liquid will slowly boil off, reducing the chance of explosion once the vials are brought to room temperature.



Two examples of
cryopreservation vials

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FOR MORE INFORMATION

- See Duke OESO's [Cryogen Guideline](#) for additional safety guidance.