

To Vice-Presidents/Deans, Heads of Schools, HoFAs

From Dr Melanie Taylor

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cc Prof M Case, Prof S Turner, Dr S A Robson, Dr D Barker, School Biological Safety Advisors, Safety Representatives

Reference Safety Circular 8/2009

## Storage of biological samples in liquid nitrogen.

Action: Following an incident in A V Hill Buildings, HOSs are asked to remind staff and students about the hazards of using liquid nitrogen storage facilities, for both health and safety, and quality assurance, reasons.

In Sept 2009, during a routine and well-established procedure, cryovials removed from a liquid nitrogen (LN) storage tank and left at room temperature for 2-3 minutes, started to explode. Fortunately, no-one was injured but considerable damage was caused to light fittings, the samples themselves were lost (and potentially contaminated a whole laboratory), and the experience was very alarming for those nearby.

A detailed investigation has revealed a number of problems, some of which are still being pursued. The focus of this circular is on LN storage. Recommendations made to the staff directly involved will be relevant to many others, and are listed below:

- the suitability of vials or other containers used for LN storage should be checked with the manufacturer/supplier. Some are simply not designed or suitable for this purpose.
- the phase to be used should also be confirmed. Many vials are recommended for use only in the vapour phase, and if accidentally placed in the liquid phase, LN will leak in through the stoppers. As they warm up and the LN expands, there is clearly a risk of explosion and loss of contents.
- for both quality and risk purposes the assessment should address the issue of cross-contamination, if more than one type of material is intended to be stored in the liquid phase. The sealability of the container will be of particular importance here.
- (for quality control purposes mainly), the method of working or SOP should also consider possible temperature gradients within the vapour phase, where temperatures above -130°C could affect cell viability.
- where liquid phase storage is appropriate, containers could be moved into the vapour phase for 24 hours before removal.
- it will be necessary to have some arrangement for establishing the liquid level during top ups.
- appropriate personal protective equipment includes a face visor selected to withstand impacts and chemical splashes.

Your usual University Safety Co-ordinator will be able to advise further,

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University Safety Advisor