NDMRB – University of Oxford

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Risk Assessment – VI-RA-005- Freezing of cells

Scope

Cryo preservation is a process where cells, whole tissues, or any other substances susceptible to damage caused by chemical reactivity or time are preserved by cooling to sub-zero temperatures. At low enough temperatures, any enzymatic or chemical activity which might cause damage to the material in question is effectively stopped. Cryopreservation methods seek to reach low temperatures without causing additional damage caused by the formation of ice during freezing. Traditional cryopreservation has relied on coating the material to be frozen with a class of molecules termed cryoprotectants (such as DMSO).

Carried out by:	Tiphaine Bouriez-Jones	**Date carried out:**	May 2015	**Review Due**:	May 2018

Hazard (Cause and consequence)	**Affected Groups**	**Existing controls**	**Risk**	**Further actions**
Exposure to chemicals (Ethanol, Industrialised Methylated Spirit, Virkon)	Staff, students and visitors	Via Inhalation: Where possible stock will only be available in solution, where powder form is unavoidable, users must weigh out and dissolve the chemical in a fume hood. Via skin adsorption: User must wear gloves and labcoat at all time. Via instillation (eye): User must wear safety spectacles at all time. **See specific COSHH risk assessment for each chemical**.	Medium	Checks on LeV
Asphyxiation in oxygen deficient atmospheres.	Staff Students Visitors	Oxygen level sensors and air change extraction system.	High	Regular checks of oxygen sensor system and extraction system to reduce chance of failure
Over pressurisation from the large volume expansion of the liquid. If liquid nitrogen enters sample vials	Staff Students	It is **imperative** that a face shield and safety glasses are worn when handling samples that have been stored in the cryostorage units.	High	Regular checks on the integrity

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during storage, the vials when removed from the liquid nitrogen can become rapidly over pressurised and explode in the face of the user.		Storage racks are being modified to prevent the storage of samples in the liquid phase.		of the face shield. Monitoring use of face shield
Cold burns, frostbite and hypothermia from the intense cold	Staff Students	Eye protection, glasses or face shield (dependant on splashing risk), closed shoes, lab coats and cryo gloves **must** be worn when handling liquid nitrogen.	Medium	PPE are checked on a regular basis by Facilities
Release or exposure of biological pathogens within the cryogenic facility	Staff, students and visitors	CL3 samples must be prepared in Biological Safety Cabinet and be placed in "Mr Frosty" prior to freezing in a -80 within the CL3 facility. After 24hr vials can be transferred to the cryogenic facility. The outside of the container must be srpayed with 70% IMS before it can be brought out of containment. Users must refer to the Biological COSHH assessment prior to starting work to understood the precautions associated with the microorganism that will be used. In case of accidental release, the cryogenic facility will be shut, until the room has been fully decontaminated and the BSO will decide when the facility is safe to re-open.	Medium	None

It is the users responsibility to ensure what controls are needed to ensure that the health of themselves and others around them. It is imperative that you **DO NOT** start any work until you are absolutely sure of the appropriate precautions that need to be employed. If you are unsure seek advice from your line/laboratory manager or your departmental safety officer (DSO).