

Equipment Laboratory Cottrell Room 4V4

This space is used for postgraduate and departmental research and storage of biological sample material.

All lab users must act responsibly and safely while working in the Sports Laboratories.

Health and Safety information

Emergency Procedure: there is an emergency procedure notice on the wall next to the telephone. Please familiarise yourself with this procedure and your location within Cottrell building (4V4).

Induction: A laboratory induction is required prior to commencing any work in the laboratory. Contact the laboratory manager to arrange an induction before you want to start.

Defibrillator: The automatic defibrillator is situated on the wall in the annex to room 3B142C.

Fire: There are two fire extinguishers located adjacent to the lift area in 4V corridor, for use in the event of a fire. If the fire alarm sounds, all lab users must exit the laboratory, leaving all bags and belongings behind. Exit the building via the nearest stairwell and congregate at a safe distance from the building.

Out of hours and lone working: A risk assessment must be carried out if working outside of standard office hours or lone working to put in place control measures to reduce the risks to as low as reasonably practicable. See University Health and Safety Policy Section 3.4 Lone Working. <https://www.stir.ac.uk/media/stirling/services/estates-and-campus-services/documents/Health-and-Safety-Policy-Document.docx>.

First Aid box: Is located on the wall by the door in Room 4B140.

First Aiders: A list of names of current first aiders are on the wall next to the door.

Reporting accidents and incidents: Minor injuries are reported to a departmental First Aider or the Safety Officer and in case of emergencies follow the emergency control procedure to arrange for emergency service response.

Risk assessments, Standard operating procedures, Safety data sheets and Manufacturer's manuals: are held on the Health and Safety Information web pages and next to the relevant equipment. <https://sportsiencesafety.stir.ac.uk/>

Laboratory Rules

Note: Wash hands before commencing lab work and before leaving the laboratory

- You must attend a laboratory induction before you start any work
- Wear personal protective equipment as required: lab coat, eye protection and gloves
- Clean the workstation area with 70% ethanol before commencing any lab work
- Food and drink are not permitted in this laboratory
- Mobile phones are not permitted when wearing gloves
- Labelling requirements: contents, initials and date and expiry date if applicable
- Standard operating procedures (SOPs) are available in the holders adjacent to equipment. Your supervisor may provide additional SOPs
- Manufacturer's manuals are also available in the holders adjacent to equipment
- Waste disposal: clinical waste is segregated from normal waste for specialist disposal. Sharps bins are also provided. Small items such as tubes and tips should be pre-bagged to avoid leaks. Inform a member of staff when bins are full
- Fridge/Freezer storage. Always fully label samples and request long term storage space. Open freezer doors for a minimum time to reduce ice build up and wear appropriate PPE (insulated gloves) for ULT handling
- If stocks of any consumable items become low or if there are any issues with equipment, spillages or breakages please inform a member of staff
- Correct use of equipment should be demonstrated by lab staff prior to use:

ULT Freezer (New Brunswick & Revco)

Freezer -20°C (Swan)

Osmometer (Gonotec)

Dual path spectrophotometer (Hitachi)

Vortex (Fisher)

Multiplex flow-based analyser (Immucor)

PCR Lightcycler (Roche)

PCR cyclor (Veriti)

Chemidoc transilluminator (Biorad)

Risk assessment / Control Procedure

Faculty	Health Sciences and Sport		
Head of Faculty	Professor Jayne Donaldson		
Safety Officer	Nidia Rodriguez-Sanchez		
Completed by	Kerry Bartie		
Date	06/04/2023		
Change log	Version 1.1	08/06/2023	Added change log Improved Lone working
Reviewed	08/06/2023	Next review due	08/2025

The activity

Activity	Research work and sample storage
Equipment used	See Hazards
Categories of people involved	Staff, UG, PG, Visitors
Location of activity	Equipment Laboratory 4V4
Duration of activity	Continual
Frequency of activity	Continual
Legal compliance to standards and regulations required	<p>Health and Safety at Work act 1974 (HSWA) https://www.hse.gov.uk/legislation/hswa.htm</p> <p>Management of Health and Safety at Work Regulations 1999 (MHSWR) https://www.legislation.gov.uk/uksi/1999/3242/contents/made</p> <p>Provision of Work Equipment Regulations 1998 (PUWER) https://www.hse.gov.uk/work-equipment-machinery/puwer.htm</p> <p>The Control of Substances Hazardous to Health Regulations 2004 (COSHH) https://www.hse.gov.uk/coshh/</p>

Hazard categories

Ethical approval requires hazards to be ascribed to a category. Use the following categories when describing the hazards in the table on the next page. Mark each category that applies clearly below.

<p>F1. Working in a dangerous area: e.g. high crime area, area of civil/political unrest, psychiatric unit or prison. Check with the Foreign and Commonwealth Office Travel Website and with University Insurance Officer prior to travel overseas. Discuss risk assessment/control measures with the management of any institution involved or with local police/law enforcement.</p> <p>- Take into account the possibility of psychological injury (trauma/PTSD and stress) as well as physical injury.</p> <p>- Give contact details and measures to be taken in case of emergency.</p>	<p>Yes</p> <p>No</p>
<p>F2. Working in an isolated geographical area: An isolated geographical area can include city parks, urban brownfield site as well as a remote hillside or a valley.</p> <p>- Take into account physical isolation through distance, screening effect of shrubbery/woodland or lack of mobile phone signal, etc. rather than just distance from “civilisation”.</p> <p>- Give contact details and measures in case of emergency.</p>	<p>Yes</p> <p>No</p>
<p>F3. Lone working: Lone working can include unaccompanied visits to research subjects in their own home, etc., as well as working alone in the field. Working alone in an office environment with access to a phone is not usually categorised as “lone working”.</p> <p>- Give contact details and measures in case of emergency</p>	<p>Yes</p> <p>No</p>
<p>F4. Working with equipment: Please detail the risks associated with this</p> <p>- List the manufacturer and model</p> <p>-Take into account how the equipment and users are affected by the location</p>	<p>Yes</p> <p>No</p>
<p>F5. Environmental hazards: e.g. extremes of weather (temperature, wind speed, ice, etc.), rough terrain, animals, plants, earthquake, water quality, contaminated land, derelict/unstable buildings are examples of factors to be considered here.</p>	<p>Yes</p> <p>No</p>
<p>F6. Chemical & biological hazards: e.g. laboratory and other chemicals and mixtures (eg, oils, acids, chemical wastes (pre-existing or generated during the project), detergents, crop spraying or fumigation, diseases (of humans, animals or plants).</p> <p>- If this section is applicable, a full COSHH risk assessment will always be required.</p>	<p>Yes</p> <p>No</p>
<p>F8. Emotional risks: e.g. sensitive research. This can include many areas that can be emotional triggers – research with or regarding children, animals, conflict (war, terrorism, holocaust studies, etc.), and natural disasters are examples.</p> <p>- The predisposition of the individuals should always be taken into account as an individual’s emotional triggers depend very much upon that individual’s personal/family history.</p>	<p>Yes</p> <p>No</p>

The Hazards

*Details under relevant heading in appendix

All hazards other than category F6 (Chemical and biological hazards) should go here

Faculty / Service Area:		FHSS, PENRG		Location:		Cottrell Room 4V4			
Description of work task / equipment /area being assessed:									
Analytical research and storage of biological material									
What are the hazards?	Hazard category	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion
ULT Freezer -20°C Freezer	F4 Equipment Harmful	Lab user risk of cold burns	Instruction, SOP Don PPE when working in the laboratory area	3	Insulated gloves are provided to protect users from cold burns Weekly inspection and annual maintenance	2	Lab user	Continual	
PCR cyclers	F4 Equipment Harmful	Lab user risk of burns from heated block	Instruction, SOP PPE when working in the laboratory area	2	Wear gloves. Avoid touching heat block. Allow to cool before unloading samples	1	Lab user	Continual	

					Monthly inspection and annual maintenance				
Lone working	F3 Lone working	<p>Investigators and participants</p> <p>a. Increased exposure to hazards due to lack of assistance from co-workers</p> <p>b. Stress and fatigue lead to poor health and function</p> <p>c. Increased risk of harm associated with isolation in case of an incident</p>	<p>See University policy</p> <p>Conduct individual risk assessment</p> <p>For some procedures lone working may be inappropriate</p> <p>Laboratory users instructed not to work alone or out of hours unless necessary</p> <p>a. Laboratory users instructed to take extra care and be aware that they are at a greater risk. Also not to perform hazardous activities.</p> <p>b. Lone workers in regular contact with their supervisors or line managers who monitor stress and wellbeing.</p> <p>c. Lone workers instructed to inform other available and</p>	4	<p>Lone working in laboratories is only considered in exceptional circumstances and on a case by case basis</p> <p>Implement appropriate control measures eg check in procedure, a SafeZone app is available for students and staff. Limit activities to those with minimal risk attached</p>	2	Investigator	On request	

			<p>competent staff of their schedule, location and contact information. For longer periods of work or more hazardous activities, periodic check – ins are required. Emergency procedures, first aid kit and telephone available in each room</p> <p>Instruction given in SOPs and induction</p>						
--	--	--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	--	--	--	--

COSHH Section

Anything in category F6 (Chemical and biological hazards) should go here

*Details under relevant heading in appendix

Manufacturers COSHH data sheets are required for all chemical hazards

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m3	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
Clinical samples		Lab users Biological hazard	Wear appropriate PPE. Use of disinfectants. See RA08 Body fluid sampling and handling Segregation of clinical waste and sharps with specialist waste disposal. See RA08 Clinical waste disposal	2	Most studies involve clinically healthy subjects not known to be infected	1	Lab user	Continual		

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m3	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
<p>Decon 90 detergent</p> <p>5% Decon working solution in spray bottle</p> <p>Irritant</p> <p>Skin</p> <p>Eyes</p>		<p>Lab users</p> <p>Skin irritation</p> <p>Eye irritation</p>	<p>Provide eye protection and disposable gloves</p> <p>Instruction on PPE during induction and in SOP</p> <p>In case of contact with eyes rinse immediately with water for 5 min</p> <p>In case of contact with skin, wash affected area with water</p>	2			Lab user	Continual		No

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m3	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
70% Alcohol Ethanol Isopropanol Irritant Skin Eyes		Lab users Flammable Skin irritation Eye irritation Used as bench cleaning solution and in small amounts in set up of Luminex analyser (< 5 mL)	Provide eye protection, lab coat. Instruction on PPE during induction and in SOP In case of contact with eyes rinse immediately with plenty of water and seek immediate medical attention In case of contact with skin, rinse immediately	2			Lab user	Continual		No

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m3	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
			with water. Seek medical attention if there is persistent irritation Stocks of absolute ethanol and isopropanol are stored in ventilated flammables cupboard in 4B140							
Milton Sterilising Solution 10% working solution		Lab users Skin irritation	Provide eye protection and gloves Instruction on PPE during	3	Eye wash and Marigold gloves in all labs using Milton	2	Lab user	Continual		No

<p>The Substance What are the hazards and *classification? *Route of exposure</p>	<p>*WEL mg/m3</p>	<p>Who might be harmed and how?</p>	<p>What are you already doing to control the risks?</p>	<p>*Risk rating</p>	<p>What additional controls (if any) are required to reduce the risks?</p>	<p>*Risk rating</p>	<p>Action by who?</p>	<p>Action by when?</p>	<p>Date of completion</p>	<p>Health monitoring</p>
<p>Irritant Skin Eyes</p>		<p>Eye irritation Used as routine lab disinfectant solution and in maintenance of Luminex analyser</p>	<p>Induction and SOP. A lab coat, eye protection and gloves should be worn at all times Spillages should be contained with absorbent material and the area rinsed with water In case of contact with eyes rinse with saline for 5 min In case of contact with skin, wash affected area with water</p>							

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m3	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
Chemical reagents Refer to relevant RA/SOP and individual SDS for Immunoassays and Nucleic acid modification		Individual lab users Skin irritant	Instruction on PPE during induction and in SOP Wear lab coat and gloves to protect the samples and user from reagents in PCR and immunoassays	3	Chemicals are used in limited quantities and conducted in small volumes (5 - 300 ul) PCR plates are sealed before for loading	1	Lab user	Continual		No
Ethidium bromide (EtBr)		Toxic Mutagen	Wear lab coat and gloves to protect the user Transport gels in sealed tub between labs	4	There is a separate waste disposal route for hazardous chemicals e.g. EtBr for nucleic acid staining	2	Lab user	Continual		No

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m3	Who might be harmed and how?	What are you already doing to control the risks?	*Risk rating	What additional controls (if any) are required to reduce the risks?	*Risk rating	Action by who?	Action by when?	Date of completion	Health monitoring
			Dispose of gloves, tips and gels by incineration		Gel buffer containing trace ethidium bromide is inactivated by destaining bags in 4B140					

Append supplier safety data sheets for all substances here:



SDS_Decon75.pdf



SDS_AbsoluteEthanol.pdf



SDS_Milton.pdf



SDS_EthidiumBromide.pdf

Appendix

Risk ratings

Risk ratings are a way of evaluating risk. A risk is defined as the likelihood that a hazard will cause harm combined with the severity of the harm. We can apply a value to a risk by using the following formula and matrix.

$$\text{Risk} = \text{Likelihood} \times \text{Severity}$$

Likelihood	Severity				
	Trivial	Minor Injury	Over 3 Day Injury	Major Injury	Incapacity or Death
Highly Unlikely	1	2	3	4	5
Unlikely	2	4	6	8	10
Possible	3	6	9	12	15
Probable	4	8	12	16	20
Certain	5	10	15	20	25

Risks can then be prioritised by their rating

- 1 Urgent Action - (Risk 15 - 25)
- 2 High Priority - (Risk 10 - 12)
- 3 Medium Priority - (Risk 5 - 9)
- 4 Low Priority - (Risk 2 - 4)
- 5 Very Low Priority - No Action Required (Risk 1)

This gives the leads to the residual risk: Low (Risk 1-4), Medium (Risk 5-9), or High (Risk 10 to 25). If the risks are acceptable (Low Risk) then you may feel able to proceed without further action. If the risk is Medium or High, then you must do something to bring the risk to a "tolerable" level.

Controls measures

Control measures are actions that reduce the risk to a tolerable level. Controls should be chosen to reduce the severity and or likelihood of a risk. Controls should be applied in an order of preference or Hierarchy of Controls:

1. Elimination – Remove the hazard
2. Substitution – Exchange the risk for something less likely or severe
3. Physical Controls – separation or isolation, prevent contact with the hazard
4. Administrative controls - safe operating procedures to ensure safe interaction with hazard
5. Information, instruction, training & supervision – warn people of the hazard and tell or show them how or help them to deal with it.
6. Personal Protective Equipment – dress people to reduce severity of harm

COSSH section

The Control of Substances Hazardous to Health Regulations 2002 require additional specific risk assessment for hazardous substances. Fill in the COSHH section for any of the substances identified under hazard category F.6 . Control is adequate when the risk of harm is 'as low as is reasonably practicable'. This means you need to demonstrate that:

1. All control measures are in good working order.
2. Exposure is below the Workplace Exposure Limit, where one exists.
3. Exposure to substances that cause cancer, asthma or genetic damage is reduced to as low a level as possible.

“A brief guide to COSHH”: <https://www.hse.gov.uk/pubns/indg136.htm>

Workplace exposure limits (WEL)

There is a maximum exposure to hazardous substances defined by law. These workplace exposure limits are given in the following document.

“EH40/2005 Workplace exposure limits”: <https://www.hse.gov.uk/pubns/priced/eh40.pdf>

COSHH Hazard classifications

This information should be given on the exterior of the container and on the COSHH data sheet supplied with the hazardous substance.

- Very Toxic
- Toxic
- Corrosive
- Harmful
- Irritant
- Sensitiser
- Dust
- Teratogenic
- Carcinogen or suspected carcinogen
- Microorganism
- Possible long-term effects

COSHH Routes of exposure

Routes of exposure are the different ways hazardous substances interact with the body. There may be more than one route.

- Contact damage to skin or eyes
- Injection
- Absorption through skin
- Ingestion
- Inhalation

Safe operating procedures

The faculty provides safe operating procedures for many activities these can be found on the health and safety web pages and in the folders located near any equipment they apply to. The activity you are planning may require an additional procedure to be written as a control. Contact the safety officer for help with this as they may be able to identify similar activities the procedure should apply to. They will also be able to advise on a suitable format and wording.

Pre operation equipment checks

Pre operation checks are detailed in operating procedures found on the health and safety web pages and in the folders located near any equipment they apply to. Fill in the form provided each time you

use the machine. Report any issues you encounter in your check and leave a note on the machine. Do not be tempted to skip pre operation checks. Faulty machinery can cause injury.

Resources, instruction, information, supervision and training

In addition to the resources mentioned elsewhere. Manufacturer user manuals are available from the health and safety webpages <https://sportsciencesafety.stir.ac.uk> and in the folders by the equipment. Training and supervision are arranged as part of the laboratory induction. Remember, you must not work in any laboratory without obtaining authorisation for the activities you wish to undertake as part of an induction. Inductions should be repeated on a regular basis as indicated on your induction record. If further instruction, training or supervision is required, please contact the person in charge of the laboratory.

Records, reporting faults

Every time you use a piece of equipment you should fill in the use form in the folder located nearby and note any faults you experience. This is important as adequate maintenance requires monitoring and maintenance periods are determined by the amount of use.

Where does this all come from?

As part of your University induction and regular training you should have taken a set of compulsory courses

<https://www.stir.ac.uk/about/professional-services/estates-and-campus-services/safety-environment-and-continuity/safety/induction-courses/>

The University has further information available on their health and safety pages

<https://www.stir.ac.uk/about/professional-services/estates-and-campus-services/safety-environment-and-continuity/safety/>

The Sport Science health and safety pages are here

<https://sportsciencesafety.stir.ac.uk>

Employers, employees and people who own buildings have a legal duty to their own safety and the safety of any others who may be affected by their activities. This mainly comes from the Health and Safety at Work act 1974 (HASAWA) and the Management of Health and Safety at Work Regulations 1999 (MHSWR). Substances used in the workplace must be used in accordance with The Control of Substances Hazardous to Health Regulations 2004 (COSHH). Work equipment must be suitable, safe and well maintained in accordance with The Provision of Work Equipment Regulations (PUWER). Further regulations apply to machinery. Machinery is a special category of work equipment which usually incorporates a motor. The legal requirements are summarised in guidance provided by the Health and Safety Executive. The guidance is much easier to read and can be found on the HSE web site.