

## Tissue Culture Lab Cottrell Room 4V2

This space is used for Postgraduate and departmental research work.

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.

**Induction:** A laboratory induction is required prior to commencing any work in the laboratory. Contact the laboratory manager to arrange an induction in good time 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:** University policy (refer to safety handbook on guidance on safety in research located on the Occupational Risk & Environmental sustainability Home Page). See links at <https://sportsiencesafety.stir.ac.uk>.

**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 again before leaving the laboratory

- You must attend a laboratory induction before you start any work
- Always wear personal protective equipment as required – minimum requirement, blue lab coat and disposable gloves
- Clean the workstation bench with detergent and then 70% ethanol and surface sterilise the biological safety cabinet with 70% ethanol before commencing any lab work
- Food and drink are not permitted in this laboratory
- Mobile phones are not permitted to be used when wearing gloves or for use as a timer
- Labelling of samples/solutions – minimum requirements, solution name, initials and date and expiry date if applicable
- Safe operating procedures (SOPs) are available in the holders adjacent to equipment. Your supervisor may provide additional SOPs. Maintenance and Calibration Procedures (MCP's) and Standard Equipment Procedures (SEP's) are available for equipment use
- Manufacturer's manuals are also available in the holders adjacent to equipment
- Waste disposal: Cell culture waste produced from tissue culture flasks, plates and pipette tips are soaked in 1% Virkon solution prior to disposal in the waste bin
- Once used, stripettes are placed in the plastic containers next to the biological safety cabinet and are discarded in the waste bin.
- Do not overfill the bin and inform a member of staff when  $\frac{3}{4}$  full
- **NB:** All clinical waste products must be soaked in 1% Virkon overnight (minimum 12 h) before leaving the laboratory
- Fridge/freezer storage. Always label boxes, tubes, bags etc. according to the labelling criteria above and ask if you require long term fridge or freezer storage space
- Lab books should be updated every time you carry out or complete an experiment

## Risk assessment / Control Procedure

Faculty	Health Sciences and Sport		
Head of Faculty	Professor Jayne Donaldson		
Safety Officer	Nidia Rodriguez-Sanchez		
Completed by	Kerry Bartie		
Change log	Version 1.2	08 June 2023	Added change log Updated Lone working
Date	06/02/2023		
Reviewed	08/06/2023	Next review due	06/2025

## The activity

Activity	Cell culture research work
Equipment used	See hazards
Categories of people involved	Staff, UG, PG, Visitors
Location of activity	Tissue Culture Laboratory
Duration of activity	Continual
Frequency of activity	Continual
Legal compliance to standards and regulations required	<p>Health and Safety at Work act 1974 (HASAWA) <a href="https://www.hse.gov.uk/legislation/hswa.htm">https://www.hse.gov.uk/legislation/hswa.htm</a></p> <p>Management of Health and Safety at Work Regulations 1999 (MHSWR) <a href="https://www.legislation.gov.uk/uksi/1999/3242/contents/made">https://www.legislation.gov.uk/uksi/1999/3242/contents/made</a></p> <p>Provision of Work Equipment Regulations 1998 (PUWER) <a href="https://www.hse.gov.uk/work-equipment-machinery/puwer.htm">https://www.hse.gov.uk/work-equipment-machinery/puwer.htm</a></p> <p>The Control of Substances Hazardous to Health Regulations 2004 (COSHH) <a href="https://www.hse.gov.uk/coshh/">https://www.hse.gov.uk/coshh/</a></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><b>F1. Working in a dangerous area:</b> 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><b>F2. Working in an isolated geographical area:</b> 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><b>F3. Lone working:</b> 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><b>F4. Working with equipment:</b> 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><b>F5. Environmental hazards:</b> 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><b>F6. Chemical &amp; biological hazards:</b> 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><b>F8. Emotional risks:</b> 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 4V2			
Description of work task / equipment /area being assessed:									
Cell culture research									
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
CO2 Incubator  Compressed gas supply  Accidental CO2 release		Lab users/Investigator  Can cause asphyxiation in high concentrations if gas released in confined space or there is insufficient ventilation  O2 displacement	a. Instruction b. SOP  Gas safe CO2 monitor in place  If CO2 levels are raised alarm sounds and CO2 supply is cut off  Users undertake Gas Safety training		Monthly inspection and annual maintenance  Annual PM service of gas safe monitor and inspection of gas storage cylinders  Wear O2 monitor when changing cylinders  Check for leaks		Competent person	Continual	

Inverted microscope		Investigator a. Eye strain b. Spillage/contamination	Instruction, SOP  Clean instrument and lens before and after use  PPE when working in the laboratory area					
Lone working		Investigators and participants  a. Increased exposure to hazards due to lack of assistance from co-workers b. Stress and fatigue lead to poor health and function c. Increased risk of harm associated with isolation in case of an incident	See University policy  Laboratory users instructed not to work alone or out of hours unless necessary  a. Laboratory users instructed to take extra care and be aware that they are at a greater risk. Also not to perform hazardous activities.  b. Lone workers in regular contact with their supervisors or line managers who monitor stress and wellbeing.  c. Lone workers instructed to inform other available and competent staff of their schedule, location and contact information.	3				

			<p>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>						
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## COSHH Section

Anything in category F.6 (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
Biological Safety Cabinet (BSC)		Lab Users/Investigator a. Spillages/contamination of individual with either clinical/biological or a chemical hazard b. Contamination of work area	Instruction, SOP a. Safety PPE for all lab workers – blue lab coat and disposable gloves b. Clean/sterilisation protocol for BSC before and after use c. Disinfection of all used t/c flasks, plates and pipettes with 1% Virkon prior to disposal		Daily inspection, when BSC is in use and annual PM maintenance service		Competent person	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
Clinical/biological waste		Lab users					Clinical/biological waste		Lab users	
Decon 90 detergent 5% working solution in spray bottle Irritant Skin Eyes		Lab users  Skin irritation, Eye irritation	Provide Eye goggles, washing up or disposable gloves  Instruction on PPE during induction and in SOP  Instruction – In case of contact with eyes rinse immediately with plenty of water for least 5 minutes.  In case of contact with skin, wash affected area	2						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
			thoroughly with water.							
70% Ethanol Irritant Skin Eyes		Investigators, Students  Skin irritation, Eye irritation	Provide Eye goggles, lab coat  Instruction on PPE during induction and in SOP  Instruction – In case of contact with eyes rinse immediately with plenty of clean, flowing water and seek immediate medical attention.  In case of contact with skin, rinse immediately with plenty of clean, flowing water.	2						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
			Seek medical attention if there is persistent irritation.  Absolute ethanol containers are stored in ventilated solvent cupboard							
Virkon 1% Solution  Harmful/Irritant  Skin  Eyes		Investigator /Lab users  Skin or eye irritation	Provide Eye goggles, lab coat  Instruction on PPE during induction and in SOP  Instruction – In case of contact with eyes rinse immediately with plenty of clean, flowing water and	2						No

The Substance What are the hazards and *classification? *Route of exposure	*WEL mg/m <sup>3</sup>	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
		Harmful if inhaled – avoid breathing vapour or spray	seek immediate medical attention.  In case of contact with skin, rinse immediately with plenty of clean, flowing water. Seek medical attention if there is persistent irritation.  Use in a well-ventilated area							
Cell culture Growth medium, e.g. DMEM, Preadipocyte		Investigator/students Eye irritation/direct contact with eyes or skin	Eye goggles are provided Personal PPE	2	Quick rinse eyewash cartridges are provided in case of emergency					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
DPBS, Wash Buffers pH6-8 Irritant			Lab coat, disposable gloves							
Penicillin-Streptomycin Possible sensitiser/Harmful if inhaled or ingested		Investigator/students May cause skin or eye irritation or breathing difficulties if inhaled	Eye goggles are provided PPE, lab coat and disposable gloves Use in a ventilated well-ventilated area	2						No

## 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://sportssciencesafety.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://sportssciencesafety.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.