University College Dublin

School of Biology & Environmental Science

Rev 6. Issued January 2024
University College Dublin
Safety, Insurance, Operational Risk and Compliance (SIRC) Office

This document must be read in conjunction with the University Parent Safety Statement

Contents

Revision History:

- Revision 3: Issued August 2016: update key personnel information.
- Revision 4: Issued August 2019: Major revision to incorporate new sections on waste management, fieldwork, lab etiquette, cryogenic liquids and nanomaterials along with provision of links to risk assessment templates. Contact details and key personnel have also been updated.
- Revision 5: Issued October 2022: minor changes.
- Revision 6: Issued January 2024: Reflecting decant from Science Centre West and relocation and reorganisation of activities.
- Revision 7: Issued February 2025: Contact details and key personnel updated.

School of Biology & Environmental Science - Safety Statement

1.0 Introduction

This document is designed to fulfil the requirements of Section 20 of the *Safety, Health and Welfare at Work Act (No. 10 of 2005)* which requires all employers to prepare a *Safety Statement*.

This document applies to the operations of *The School of Biology and Environmental Science (SBES)* located on the Belfield Campus of *University College Dublin* and to its field operations. The School is located in the *Science Centre East building and at the Rosemount Environmental Research Station on the Belfield Campus.*

This document when read in conjunction with the *University Parent Safety Statement* and relevant risk assessments outlines how the health and safety of staff, students and visitors to the school will be safeguarded.

This document will be subjected to review on a regular basis and also when changes in work practices necessitate it.

All persons are strongly encouraged to develop local area safety plans and procedures to complement the contents of this document where they deem it necessary or useful to do so.

2.0 School Description

Located at the heart of the Belfield campus in the UCD O'Brien Centre for Science, the School of Biology and Environmental Science (SBES) is the largest teaching and research centre for biology in the Republic of Ireland. One unique feature of the School is the inter-disciplinary nature of its activities, providing students and scientists alike with critical knowledge and perspective about modern biology.

School of Biology & Environmental Science - Safety Statement

The School delivers undergraduate degrees in Cell and Molecular Biology, Plant Biology, Zoology and Environmental Biology. We also co-teach the BSc degree in Genetics. At postgraduate level the School delivers MSc degrees in Plant Biology & Biotechnology, Global Change: Ecosystem Science & Policy and Applied Environmental Science as well as an online MSc in Environmental Sustainability. The School also co-teaches the MSc Biological & Biomolecular Science (Negotiated Learning) Programme.

This broad portfolio of teaching is strongly informed by our research. The School is actively engaged in four key areas of interlinked thematic research; Ecosystems, global change and sustainability; evolution and population biology; plant sciences; and cellular systems The breadth of expertise that we have also facilitates our involvement in large scale research activities in UCD, and our staff actively contribute to the UCD Conway Institute for Biomolecular & Biomedical Research and the UCD Earth Institute. At national level the School provides expertise that informs environmental and sustainable management policies, supporting agricultural and food industries. In total the School is home to approximately 39 research groups.

The School contains teaching and research laboratories along with ancillary facilities. Teaching laboratories are located on the 1st floor of Science Centre East whilst the research facilities are temporarily co-located between Science Centre South and East and the Earth Institute, 4th floor Science Centre East. The Rosemount Environmental Research Station, located separately on the Belfield campus, is a multidisciplinary facility but used primarily by our School and the School of Agriculture & Food Science. We also run some field trials on UCD Lyon's Farm. Fieldwork is used extensively throughout the School both as a teaching method and in research.

Further details can be found on the School website: https://www.ucd.ie/bioenvsci/

3.0 Management of Health and Safety within the School

University College Dublin is committed to providing a safe place of work for all of its employees and to providing a safe environment for students in which to carry out their studies and associated activities. The University is also committed to ensuring that, in so far as is reasonably practicable, its actions and activities do not have a negative impact on the safety of any third parties.

The Head of School is responsible for ensuring or making arrangements to ensure that the activities undertaken within the school are carried out in a safe manner without undue risk to the health and safety of University employees, students or any third parties.

All employees have a duty to cooperate with the University in all matters of health and safety at work and not to endanger the safety of themselves, their co-workers or any other parties through any act or omission that they may undertake. This cooperation is essential to the effective management of safety within the University. In accordance with safety legislation the University expects all employees to take responsibility for their own safety whilst at work and to perform their duties in a safe manner and in accordance with all relevant safe working procedures.

The University encourages employees to become actively involved in safety matters and welcomes all suggestions or comments regarding safety which can be made to the local Safety Committee, where they can be dealt with most efficiently.

Refer to the University Parent Safety Statement for further details

4.0 Key Contact Details

Title	***Name***	***Contact Details***
Head of School	Prof. Mary Kelly-Quinn	(716) 2337
Chair of SBES Safety Committee	Assistant Prof. Nicholas Brereton	
School Safety Co-ordinator/ Chief Technical Officer	Ms. Gwyneth MacMaster	(716) 2336
University SIRC Manager	Ms. Sarah Carry	(716) 8770
Fire Alarm Maintenance Company	Contact UCD SIRC Office	(716) 8768 / 8771
Fire Extinguisher Maintenance Company	Contact UCD SIRC Office	(716) 8768 / 8771
Student Health Centre		(716) 3133
UCD Chaplaincy		(716) 8372
UCD 24 HR Emergency Line		(716) 7999
Campus Duty Manager		(716) 7666
Campus Services		(716) 7000

Emergency First Aid treatment and equipment is available from the local Services Desks and via the 24-hour Emergency line 716 7999

School of Biology & Environmental Science First Aiders

During normal working hours (i.e. 9:00-17:00) the following personnel may be contacted if first aid is required.

Science Centre:

Name	**Extension No.**	**Location**
Dr. Liz Conroy	(716) 2339	E3.20
Ms. Frances Downey	(716) 2615	E3.30
Ms. Anna David	(716) 2615	E3.30
Dr. Carlotta Sacchi	(716) 2615	E3.30
Dr. Sean Storey	(716) 2338	E3.30
Ms. Jeanette Carlsson	(716) 2292	E4.21
Dr. Cristina Casalou	(716) 2615	E3.30
Mr. Liam Connell	(716) 2615	E3.30
Ms. Thalia Christodolou	(716) 2292	E4.21

Rosemount Environmental Research Station:

Name	**Extension No.**
Mr. Gordon Kavanagh	(716) 2115
Mr. David Brogan	(716) 2401

Outside of these hours, first aid treatment is available via the 24 hour emergency line 01- 716 7999.

School of Biology & Environmental Science Fire Marshals

Science Centre East 3rd Floor:

Name	**Extension no.**	**Location**
Dr. Rainer Melzer	(716) 2290	E3.25
Dr. Sean Storey	(716) 2615	E3.30
Ms. Frances Downey	(716) 2615	E3.30
Ms. Gwyneth MacMaster	(716) 2336	E3.44
Dr. Carlotta Sacchi	(716) 2615	E3.30
Ms. Jennifer Coughlan	(716) 2829	E3.30

Science Centre East 4th Floor:

Name	**Location**
Ms. Thalia Christololou	E4.21
Ms. Jeanette Carlsson	E4.21

Science Centre East 1st Floor (teaching):

All demonstrators and module co-ordinators are considered fire marshals within the teaching area.

Rosemount Environmental Research Station:

Name	**Extension no.**
Mr. Gordon Kavanagh	(716) 2115
Mr. David Brogan	(716) 2401

There are Automated External Defibrillators (AED's) located in the following locations in the Science Complex:

- Science East – Ground floor lobby at entrance to Science Hub
- Science South – Ground floor entrance lobby near stairs
- Rosemount Environmental Research Station-Main reception area

5.0 Employee Safety Representation

University College Dublin is committed to involving and consulting employees in the management of health and safety within the University. To this end the University encourages active participation by employees as Safety Representatives or in a Safety Committee System. The functions of Safety Representatives are to act as a medium for employees within a College / School to raise safety concerns and for the *University SIRC Office* and College / School Management to impart information on health and safety matters.

Representation on the committee is drawn from a broad spectrum of areas within the school. All persons sitting on the committee are classed by the University as Employee Safety Representatives as outlined in Part 4 of the 2005 Safety, Health and Welfare at Work Act.

Employees have a right under this legislation at any time to elect from their number such *Employee Safety Representatives*.

Any persons wishing to act as *Employee Safety Representatives* should contact their Head of School in the first instance.

6.0 Emergency Response Plans

Introduction

The purpose of these emergency response plans is to detail the steps and responses that must be taken in the event of an emergency within the School. Where deemed necessary; individual units within the school may further develop these plans to take account of the individual circumstances in their areas.

The following are deemed as emergencies within the School:

1. Fire
2. Natural Gas Leak
3. Laboratory Gas Alarm Activation
4. Loss / Spillage of a Chemical Agent
5. Loss / Spillage of a Biological Agent
6. Chemical Agent Exposure
7. Biological Agent Exposure
8. Personal Injury
9. Major Campus Emergency

6.1 Fire

If you hear the fire alarm:

1. Do not panic but prepare to leave the building.
2. The alarm will sound continuously; leave the building immediately in an orderly fashion by following the green man running signs to the nearest exit. Please note that this may not be the same way that you entered the building.

3. Classes in session must be dismissed and students directed to leave.

4. Persons in laboratories and workshops should make their area safe before leaving by turning off equipment where possible, closing chemical containers, securing biological agents, etc.
5. Do not use the lift.
6. Do not go back to your working area for any reason.
7. If for any reason you are unable to leave the building, make your way to a protected stairwell or a room with an external window and shut the door. If possible, inform the emergency line (**ext. 7999**) or a colleague of your location and the reason why you cannot safely exit the building.
8. If safe to do so nominated *Fire Marshals* should inspect their designated areas. Proceed to your designated emergency assembly following your departure from the building. The assembly areas for the Science Building and Rosemount Environmental Research Station are:
   - **Car Park Beside Veterinary Science Centre**
   - **Beside the Lake (CSCB End)**
   - **In Front of the Church**
   - **Pedestrian Area in Front of Computer Centre**
   - **Rosemount – beside the main Rosemount sign (bottom of the avenue)**
9. Report any knowledge you may have of missing or injured personal to a *Fire Marshal.* Return to the building only after the *Chief Fire Marshal/ Services Personnel* give the all clear signal.

If you observe a fire:

1. Activate the fire alarm by breaking one off the red wall mounted break glass units
2. If it is safe to do so and you have been trained to do so the fire may be tackled using a suitable fire extinguisher, but only if this does not place any person at risk of injury.
3. If you decide to fight a fire, ensure that you have a safe and clear means of escape from the fire at all times.
4. In the case of chemical fires be aware that many chemicals give off poisonous fumes under fire conditions. Only fight chemical fires if you are certain that it is safe to do so and that the products of combustion can be avoided.
5. In the event that you cannot fight the fire, or the fire begins to get out of control evacuate the area immediately.

Fire Extinguisher Types

Aqueous Film Forming Foam

- Red cylinder with a cream coloured label.
- Suitable for fighting paper, wood, fabric, etc fires.

- Not suitable for use on electrical fires.
- Suitable for use on most chemical fires.

Carbon Dioxide

- Red cylinder with a black label and a black discharge horn.
- Suitable for fighting electrical fires.
- Not suitable for paper or fabric fires as the gas is discharged under pressure and can blow embers around.
- Not suitable for use in a confined space due to the asphyxiant nature of the carbon dioxide.
- Discharge horn can get very cold during use.

Dry Powder

- Red cylinder with a blue label.
- Suitable for all types of fires including electrical and chemical.
- Can be very messy and can damage electronic equipment.

To Use A Fire Extinguisher:

- Remove from wall bracket if necessary.
- Break the seal and remove the pin.
- Squeeze handle to test the extinguisher.
- For carbon dioxide extinguishers manually turn discharge horn into position before testing. Once used do not touch the discharge horn again as it gets very cold.
- Fight fire by aiming extinguisher at the base of the fire.

6.2 Gas Leak

- In the event that a natural or laboratory gas leak is suspected then the 24hr Emergency Line (ext. 7999) must be contacted.
- The area should be evacuated.
- Only authorised personnel may interfere with gas safety systems.

6.3 Laboratory Gas Alarm Activation

In the event of an activation of a laboratory gas alarm, follow local gas alarm response procedures.

Science Centre East:

When an oxygen depletion alarm sounds the BLUE strobe light in each laboratory and instrument room on the affected floor will flash and the local siren will sound.

1. Evacuate room immediately. Do not re-enter the room until safe to do so. Assemble at the central atrium areas of each floor.

10. If instructed by a member of the Technical Staff, Science Operations or Campus Services leave the building.
11. Contact a member of Staff as per contact list located beside the panel. If there is no response please contact below.
12. During Office Hours Contact Science Welcome Centre 01-716 2845 to request assistance. They will act as Incident controller and complete the appropriate remedial actions.
13. Out of Hours please contact UCD 24 hour Emergency line 01-716 7999. They will act as Incident controller and complete the appropriate remedial actions.
14. Only authorized persons (above) are to deal with the Gas Detection Panel.

6.4 Loss / Spillage of a Chemical Agent

In the case of a spill or leak of a chemical agent the following procedure should be followed:

- In the event that a chemical is spilled or is discovered to have leaked then all persons should be verbally requested to leave the affected area immediately.
- Where possible windows should be opened but all doors shut be kept closed.
- If the spilled material is flammable all possible sources of ignition, including electrical appliances should be turned off if safe to do so.
- The SDS for the chemical concerned should be consulted before dealing with the spillage and the information contained therein utilised to ensure a safe cleanup response.
- For large spills (>10 litres / kgs) the University SIRC Office should be informed by dialling 8768 / 8771 or 7999 on an internal telephone.
- In the event that the spillage is deemed safe to deal with a spill kit should be obtained.

- Suitable personal protective equipment should be donned by the persons dealing with the spillage. At the very least safety glasses, gloves and a lab coat should be worn. All spills must be attended by at least two persons.
- The source of the leak should be ascertained and if possible and safe to do so closed or sealed. Any damaged containers should be removed and repackaged if possible.
- In the event of liquid spills adsorbent pads or vermiculite should be spread over the spilled material until it is covered. If necessary absorbent booms should be used to prevent the spillage spreading further.
- Using a dustpan and brush or similar the spilled material along with the absorbent material should be collected and placed into the bag / container contained within the spill kit.
- In the event of the spillage of a solid material the material should be collected using a dustpan and brush and placed into the bag / container contained within the spill kit.
- All wastes and all contaminated items generated by spillages must be disposed of in a suitable manner.
- When dealing with spillages the inhalation of large amounts of vapour or air borne contaminants should be avoided. In the event that a large amount of material is spilled then specialist assistance may be required. Respiratory protection may be required when dealing with large spillages. Persons must note that non-air fed respiratory protection is not a substitute for decreased ambient oxygen levels.
- Some chemicals require specialist responses, e.g. elemental mercury, cyanides, strong acids, etc. Reference should be made to a materials' SDS before it is used in the laboratory for the first time and if required any recommended specialist spill response equipment should be sourced and held in a suitable location.

6.5 Loss / Spillage of a Biological Agent

For spillages where aerosols are not likely to be produced persons should don the necessary PPE (gloves and a lab coat at a minimum) and treat the affected area with an appropriate dry disinfectant or cover with tissue paper and apply a liquid disinfectant. The treated area should be allowed to remain long enough for the disinfectant to take effect before being cleaned and the waste material being disposed off accordingly. As a rule, *Virkon* and *Presept* should be used for the treatment of spillages of biological agents. If a different disinfectant is required, then this should be indicated in any relevant risk assessment.

Where a spillage may give rise to aerosols, e.g. during the rupture of a sample tube in a centrifuge, the area must be evacuated, and the droplets allowed time to settle. Persons then wearing appropriate PPE (gloves, lab coat and barrier face mask) may enter the effected area treat the spillage. In some cases, extensive decontamination of the working area may be required. If deemed necessary testing for the presence of the biological agent can be done following the completion of the disinfectant procedure. Respiratory protection may be required when dealing with spillages that have generated aerosols.

6.6 Chemical Agent Exposure

Some agents require specialist first aid responses, e.g. hydrofluoric acid, cyanides, etc. Reference should be made to a material's SDS before it is used for the first time and if required any specialist first aid equipment should be sourced and held in a suitable location and any unusual first aid responses should be noted.

The following are general guidelines for treating exposures to chemical agents.

Inhalation

- Following exposure to an airborne chemical; affected persons should be removed from the source of exposure to fresh air.
- At no time should persons place themselves at risk when trying to remove affected persons from the source exposure.
- If breathing stops then artificial respiration should be administered – note this may not be possible if corrosive or toxic materials are on the lips or in the mouth.
- If available, oxygen may also be administered.
- Any exposure which results is vomiting, or unconsciousness must be referred to a medical practitioner.

Skin Contact

- Remove any contaminated clothing and wash (not scrub) the skin with soapy water.
- If required utilise an emergency shower if one is available.
- If the skin blisters or becomes reddened, then seek medical advice.

Eye Contact

- Wash out eyes with copious amounts of fresh water and seek medical advice.

Ingestion

- Refer to the specific MSDS. Always seek medical advice.

For further information contact the National Poisons Centre on 01 809 2166 (7 Days a Week: 8am – 10pm).

If seeking medical advice after a chemical exposure, ensure that the patient has in their possession a copy of the relevant SDS.

6.7 Biological Agent Exposure

Any person who suspects that they may have been exposed to a biological agent must contact the UCD SIRC Office (ext. 8768 / 8771) immediately. Medical assistance / advice must be sought as soon as is possible.

For needle stick / sharps type injuries:

1. Cuts caused by sharps should be treated immediately. No attempt should be made to remove broken glass from wounds. Needle stick injuries from contaminated needles should be encouraged to bleed. Wash well under running water and cover with a dry dressing. An attempt should be made to identify any chemical or biological hazard in the needle that may have been injected.
2. Apart from very minor injuries, a First Aider should be called.
3. In the event of sustaining an accident resulting in a wound:
    - Immediately wash the wound liberally with soap and water but without scrubbing
    - Do not attempt to remove any glass by hand
    - Gently encourage free bleeding of puncture wounds but do not suck the wound
    - Dry the area and apply a waterproof dressing
    - Seek medical advice if the sharp concerned was contaminated with any hazardous materials

There is no evidence available to show that using antiseptics or squeezing a wound will reduce the risk of transmission of a blood borne pathogen. Using a caustic agent such as bleach to wash a wound is not recommended.

6.8 Personal Injury

In the event that a person suffers an injury that requires first aid treatment then:

Treat the injury using first aid equipment. First aid equipment can be sourced from the following locations or from the 24hr Emergency Line (7999).

Science East:

- E0.37 (workshop)
- E3.47 (Environmental Lab)
- E3.23 (Animal CMB lab)
- E3.26 (Plant CMB lab)
- E3.30 (Technical Office)
- Teaching labs, 1st floor Science East
- Each lab in the Earth Institute, 4th Floor Science East

Science South:

- S1.45 (Animal CMB lab)
- S0.30 (BSL 2+ lab)

Rosemount:

- Production Glasshouse
- Containment glasshouse
- PEAC facility
- Preparation area

- If necessary, contact a trained first aider.
- If the emergency services are required, then the 24hr Emergency Line should be contacted (7999) and the request made.

6.9 Campus Emergency

In the event that notification of a major campus incident is received then all staff and students should adhere to the *Shelter-Shut-Listen* model of response.

- In the event that a critical incident is notified then staff and students should **shelter** in a building, preferably in a secure area with access to a telephone and the UCD computer network. Lecturers

should direct the students to remain indoors and should seek further information on their behalf via the UCD website, local Services Centre or the emergency line (7999).

- Staff should remain **shut** in their location until they are advised that the incident is over or until they are requested to leave the area.
- In the event that staff are required to evacuate an area the building fire alarm will be used to inform all building occupiers and further instructions will be given upon building evacuation.
- Unless instructed to do otherwise staff should remain indoors and **listen** for further instructions.
- Further instructions may be issued via voicemails; website; e-mail; campus siren, etc.

6.10 Contacting the Emergency Services

In all instances contacting the Emergency Services must be done via the *Services First Response Room* using the 24hr Emergency Line (**7999**). Services personnel will then contact the Emergency Services and ensure that they are met upon their arrival on campus and are escorted to the correct location of any incident.

Any fire, hazardous agent spillage, exposure to a chemical agent, personal injury, etc. or near miss must be notified to the University SIRC Office using an official accident report form. Such forms can be obtained from the University SIRC Office or here. Contact sirc@ucd.ie or ext. 8768 / 8771.

7.0 Location of Emergency Equipment

Fire Extinguishers

- Fire extinguishers are located throughout all buildings and are readily available in all locations.

First Aid Boxes

- First Aid boxes are located throughout the school in all the teaching and research labs. See section 6.8 for locations.
- First aid equipment is also available via the 24hr emergency line – 7999.

Automatic External Defibrillators (AED's)

AED's are located in the following locations around the University:

- Agriculture & Food Science Entrance Lobby
- Arts Annexe – Geary Institute Entrance Lobby
- Belfield Office Park – Blocks 9/10 Entrance Lobby (Nexus UCD)
- Campus Services Mobile Jeeps
- Conway Institute Undergraduate Area
- Computer Science Centre - Main Entrance Lobby
- Engineering & Materials Science Centre First Floor
- Health Sciences Entrance Lobby
- James Joyce Library Admissions Desk
- Lyons Estate
- Main Restaurant Lobby
- Mobile Services Patrol Vehicle
- Newman Building Main Entrance Lobby
- Newstead Main Entrance Lobby
- Nova UCD
- National Virus Reference Lab (NVRL) Reception
- President's Lodge
- O'Reilly Hall
- Quinn School of Business Reception Desk
- Richview Architecture Building – Main Entrance Lobby
- Roebuck Offices Main Entrance
- Rosemount Environmental Research Station
- SBI (Systems Biology Ireland) - SBI Reception

- Science Centre East at Entrance to Hub
- Science Centre South Ground Floor Lobby
- Smurfit School of Business Services Desk, Blackrock
- Smurfit School of Business Library Corridor
- Sports Centre and environs x 2
- Student Health Centre
- Tierney Building – Main Entrance Lobby
- UCD Bowl
- Veterinary Hospital
- Veterinary Science Main Entrance

Blackrock Campus AED Locations:

- Blackrock Smurfit S.O. Business - Services Desk
- Blackrock Smurfit S.O. Business - Library Corridor
- Blackrock Smurfit S.O. Business - Management House Lobby Area

Lyons Estate AED Location:

- Farm Office

Belfield Office Park AED Location:

- Blocks 9 and 10 Entrance Lobby / Nexus UCD

For training in the use of defibrillators please contact aed@ucd.ie. AED's in locations in closest proximity to SBES see section 4.0.

8.0 Out of Hours Access

Out of hours access is considered to be 18:00-08:00 Monday – Friday, all weekends and bank holidays. During this time only people with swipe cards can access the science East or West building. Undergraduate students are not allowed access during this time unless they are accompanied by a member of staff. No work which carries a high risk of personal injury may be carried out during out

of hours periods. Out of hours working should be avoided where possible and must be subjected to a lone working risk assessment if applicable.

9.0 Fieldwork Safety

Fieldwork is an integral part of the School, and is used in teaching and research, both nationally and internationally. All fieldwork activities must be subjected to risk assessments prior to taking place.

10.0 Safety Induction Training

Safety induction training is required for all laboratory and field users throughout the School before they can start work. Induction training is provided by the Technical Officers within the School and signed by the Principal Investigator (PI). It is the responsibility of the PI to ensure their students are competent in safety before they enter laboratories or the field. Safety Induction forms are located on our website.

11.0 Waste Management

It is the responsibility of all students and researchers in the School of Biology & Environmental Science to dispose of hazardous and non-hazardous waste in a safe and responsible manner. Non-hazardous materials can be disposed of in the regular waste bins located across the School. All hazardous waste can be disposed according to their category in specialised containers.

12.0 Correct Laboratory Etiquette

All laboratories in the School of Biology & Environmental Science are considered shared work spaces. All staff, students, researchers and visitors should therefore follow the Lab Safety Guidelines (Appendix 8) to maintain a safe working environment for themselves and others. Headphone and ear buds are not permitted to be worn in the laboratories.

13.0 Storage of Chemicals

All people using chemicals are responsible for making sure they are stored appropriately.

- Chemical bottles must be capped when not in use
- Compatibility of chemicals should be checked before storage so that incompatible materials can be stored separately.
- Safety Data sheets (SDS) should be readily available/ accessible for all that are in use in the laboratories. However, only paper copies for the following categories are required to be stored in the lab.
- All chemicals held in a volume over 1kg/ 1L
- All carcinogenic, mutagenic or teratogenic chemicals
- All very toxic and toxic chemicals
- All chemicals used on a daily basis
- All chemicals whose usage is deemed to be of a moderate risk or higher following a risk assessment.

14.0 Working with Liquid Nitrogen

Liquid Nitrogen is a commonly used chemical in the School. As such, all personnel should, at the very least be aware of the hazards associated with cryogenic liquids. All persons intending to use liquid nitrogen should consult the UCD guide to the Safe use of Liquid Nitrogen, available from the UCD SIRC website. Safety goggles must always be worn when working with liquid nitrogen. Under no circumstances should people travel in a lift with any quantity of liquid nitrogen. If required to move 25L belly dewers via a lift, the lift must be locked using a lift key.

15.0 Workshop Safety

Workshops inherently contain many hazards. Only trained, competent personnel are permitted to operate the machinery it contains.

16.0 Nanomaterial Safety

Nanomaterials are used in several laboratories across the School. Users must receive induction training from a member of the technical staff before they can work with them for the first time. An

SOP for the School can be found in the supplemental information of the following paper: Vivien Stuttgen, *Hugh E. Giffney, Ayana Anandan, Anwar Alabdali, Caroline Twarog, Samir A. Belhout, Mark. O'Loughlin, Lucia Podhorska, Colm Delaney, Niamh Geoghegan, Jessica Mc-Fadden, Nahlah A. Alhadhrami, Aisling Fleming, Shreyas Phadke, Ravi Yadav, Sarinj Fattah, Fiona McCartney, Shada Ali Alsharif, Jasmin McCaul, Krutika Singh, Sumesh Erikandath, Fergal O'Meara, Jacek K. Wychowaniec, Meritxell B. Cutrona, Gwyneth MacMaster, Alison L. Reynolds, Susan Gaines, Bridget Hogg, Marc Farrelly, Mark d'Alton, Peter Coulahan & Sourav Bhattacharjee (2019) The UCD nanosafety workshop (03 December 2018): towards developing a consensus on safe handling of nanomaterials within the Irish university labs and beyond – a report, Nanotoxicology, 13:6, 717-732,*

17.0 Risk Assessments

17.1 Risk Assessment Methodology

It is the aim of *University College Dublin* to identify hazards in the workplace and to control the risks from those hazards in so far as is reasonably practicable. 'Hazard' is defined as the potential to cause harm, while 'risk' is defined as the potential of the hazard to cause harm under the actual circumstances of use. The assessment of risk from the hazards identified is based on the linkage of the probability of occurrence with the severity of injury or material loss (the hazard effect) resultant from that occurrence.

Probability is determined based on an assessment on how likely it is that an adverse event related to the hazard concerned will occur. Probabilities are graded as:

- *Unlikely*: the adverse event being considered will occur only rarely.
- *Likely:* the adverse event being considered will occur on a frequent basis
- *Very Likely:* the adverse event being considered is almost certain to occur

Severity is based on the degree of personal injury or damage to property likely to occur in the event that the adverse event occurs. Severity of outcome is graded as:

- *Slightly Harmful:* e.g. superficial injuries; minor cuts and bruises; nuisance and irritation; temporary discomfort; minor infection; minor material damage.
- *Harmful:* e.g. lacerations; burns; concussion; sprains; minor fractures; dermatitis (temporary); asthma (temporary); long term discomfort; infection requiring medical treatment; significant material damage.

- *Very Harmful:* e.g. fatality; amputation; major fracture; severe poisoning; cancer; life shortening condition / disease; deafness; head injuries; eye injuries; substantial material damage.

The risk assessment matrix below is used to calculate the risk posed by any hazard by linking the probability of an adverse occurrence with the severity of injury or material loss (the hazard effect) resultant from that occurrence.

Table 1. Risk Assessment Matrix

	Severity of Outcome Of Negative Event		
Probability of Negative Event	**Slightly Harmful**	**Harmful**	**Very Harmful**
Unlikely	***trivial risk***	***acceptable risk***	***moderate risk***
Likely	***acceptable risk***	***moderate risk***	***substantial risk***
Very Likely	***moderate risk***	***substantial risk***	***intolerable risk***

- *Trivial Risk:* No further action required.
- *Acceptable Risk:* No additional risk control / reduction measures required
- *Moderate Risk:* Further risk control / reduction measures should be considered and implemented were possible. Hazards graded as *Moderate Risk* must be closely managed.
- *Substantial Risk:* Further risk control / reduction measures must be identified. If the risk cannot be reduced further, then the hazard must be strictly managed, and the frequency and duration of the hazard must be reduced to as low a level as practicable along with the number of persons exposed to the hazard.
- *Intolerable Risk:* All work involving this hazard is prohibited.

The aim of any risk control / reduction measures identified and implemented are to reduce the residual risk from the hazard to as low a level as is reasonably practicable.

Where practicable, *University College Dublin* commits itself to the elimination of hazards. Where the risk from a hazard cannot be eliminated at source then the University will supply a range of suitable personal protective equipment in order to protect employees where necessary.

Risk assessments will be reviewed regularly and when changes in work practises arise within the University or when new activities are introduced. All staff and postgraduate students must be familiar with the contents of the risk assessments that are relevant to their work. Training and further information on workplace safety and risk assessment is available from the *University SIRC Office* (email:sirc@ucd.ie).

Staff and postgraduates working within *University College Dublin* must review all relevant available risk assessments (see register of risks below) prior to initiating work or undertaking new tasks to establish whether or not these documents identify and manage the hazards associated with their work adequately. In the event that existing risk assessments do not adequately manage the hazards associated with their work employees and postgraduates should either complete their own risk assessments (templates available on UCD SIRC Office website); inform their local Safety Committee or inform the *University SIRC Office*.

An Office Safety Handbook which outlines the risk associated with working in an office environment is available for review by persons who work in said environment.

For those persons who as part of their duties have to meet members of the public face to face or engage in 'home visits' a set of Safety Guidelines has been developed which should be consulted by same persons required to complete risk assessments for chemical, biological or fieldwork hazards are strongly encouraged to consult the *University College Dublin Biosafety*; *Chemical Safety and Fieldwork Safety Manuals* for guidelines and detailed safety information.

17.2 School of Biology & Environmental Science Register of Risks

The following risk assessments are deemed to be relevant to the operations of SBES. The most current versions of these risk assessments are available on the UCD SIRC Office website.

Persons working within the school must make themselves familiar with the contents of all risk assessments which are relevant to their assigned duties and work in accordance with the provisions contained therein.

Table 2. *School of Biology & Environmental Science*
Register of Risk Assessments

General Risk Assessments *These risk assessments may apply to all persons working within the school*			
Risk Assessment Number	**Title**	**Risk Rating**	**Comment**
UCDA1	Manual Handling (General)	Acceptable Risk	

UCDA2	Access and Egress	Acceptable Risk	
UCDA3	Bullying and Harassment	Moderate Risk	
UCDA4	Workplace Housekeeping	Acceptable Risk	
UCDA5	Pregnant Employees (General)	n/a	Contact UCD SIRC Office to arrange Risk Assessment
UCDA6	Home Working	Trivial Risk	
***General Risk Assessments* Contd.**			
Risk Assessment Number	**Title**	**Risk Rating**	**Comment**
UCDA7	Presence on a Third Party Site (General)	Moderate Risk	
UCDA8	Kitchen / Tea Making Areas	Trivial Risk	
UCDA9	Driving / Use of Vehicles	Substantial Risk	
UCDA10	Foreign Travel	Acceptable Risk	
UCDA11	Lone Working (General)	n/a	Risk rating to be decided on an individual basis
UCDA12	Workplace Stress	Moderate Risk	
UCDA13	Use of Passenger / Goods Lifts	Trivial Risk	
UCDA14	Noise (General)	Acceptable Risk	
UCDA15	Use of Personal Protective Equipment (General)	Trivial Risk	
UCDA16	Travel Within Ireland	Acceptable Risk	
UCDA17	Violence and Aggression (General)	Acceptable Risk	
UCDA18	Fire (General)	Moderate Risk	
UCDA19	Electricity (General)	Moderate Risk	
Office Risk Assessments *These risk assessments may apply to persons working within an office environment within the school*			
Risk Assessment Number	**Title**	**Risk Rating**	**Comment**

UCDB1	Office Safety (General)	Acceptable Risk	
UCDB2	Use of Display Screen Equipment	Acceptable Risk	Contact SIRC Office to arrange individual assessment
UCDB3	Electricity in the Office	Acceptable Risk	
UCDB4	Fire in the Office	Acceptable Risk	
UCDB5	Manual Handling in the Office	Acceptable Risk	

Chemical Agents Risk Assessments

These risk assessments may apply to persons working with chemical agents within the school

Risk Assessment Number	Title	Risk Rating	Comment
UCDC1	Handling and Use of Chemical Agents (General)	Moderate Risk	For general guidance purposes, only. Reference should be made to the more specific risk assessments for chemical agents. In the event that no risk assessment is available for a chemical agent then the user must arrange for one to be completed prior to using the agent for the first time.
UCDC2	Storage of Chemical Agents (General)	Moderate Risk	The large-scale storage of chemical agents (i.e. 00's of litres / kgs may require the completion of a more specific risk assessment).
UCDC3	Handling and Use of Flammable Liquids / Organic Solvents (General)	Acceptable Risk	
UCDC4	Cryogenic Liquids (General)	Acceptable Risk	
UCDC5	Use of Compressed Gases (General)	Acceptable Risk	
UCDC6	Use and Handling of Corrosive Chemicals (General)	Acceptable Risk	
UCDC8	Use and Handling of Cyanide Compounds (General)	Moderate Risk	

UCDC9	Use and Handling of Mercury and Mercuric Compounds (General)	Acceptable Risk	
UCDC10	Use and Handling of Organic Peroxide Compounds (General)	Acceptable Risk	
UCDC11	Use and Handling of Potentially Explosive Materials (General)	Acceptable Risk	
UCDC12	Use and Handling of Laboratory Diagnostic Kits (General)	Acceptable Risk	
Risk Assessment Number	**Title**	**Risk Rating**	**Comment**
UCDC13	Use and Handling of Carcinogens and Mutagens (General)	Moderate Risk	For general guidance purposes only. A specific risk assessment for every carcinogen and mutagen in use must be completed prior to using the agent for the first time.
UCDC14	Use and Handling of Teratogens and Reproductive Toxins (General)	Acceptable Risk	
UCDC15	Use and Handling of Irritants, Harmful Agents and Sensitisers (General)	Acceptable Risk	
UCDC16	Use and Handling of Toxic Agents (General)	Acceptable Risk	
UCDC17	Use and Handling of Dry Ice (General)	Acceptable Risk	

Biological Agents Risk Assessments *These risk assessments may apply to persons working with biological agents within the school*			
Risk Assessment Number	**Title**	**Residual Risk Rating**	**Comment**
UCDD1	Handling and Use of Class 1 Biological Agents	Trivial Risk	
UCDD2	Handling and Use of Class 2 Biological Agents	Acceptable Risk	
UCDD3	Use and Propagation of Cell Lines (General)	Acceptable Risk	

UCDD4	Handling and Use of Biological Material of Human / Animal Origin	Acceptable Risk	
UCDD5	Diagnostic Laboratories (General)	Acceptable Risk	
UCDD7	Centrifugation of Biological Samples (General)	Acceptable Risk	
UCDD8	Dealing with Biological Agent Spillages	Acceptable Risk	
UCD09	Zoonoses (General) Risk Assessment	Acceptable Risk	
UCD10	Use and Propagation of Cancer Cell Lines (General) Risk Assessment	Acceptable Risk	

Laboratory Risk Assessments *These risk assessments may apply to persons engaged in laboratory work within the school*			
Risk Assessment Number	**Title**	**Residual Risk Rating**	**Comment**
UCDE1	Use of Centrifuges (General)	Acceptable Risk	
UCDE2	Use of Autoclaves (General)	Acceptable Risk	
UCDE3	Use of Bunsen / Gas Burners (General)	Acceptable Risk	
UCDE4	Cold Rooms / Walk in Freezers (General)	Acceptable Risk	
UCDE5	Use of Fridges / Freezers (General)	Trivial Risk	
UCDE6	Use of Laboratory Glassware (General)	Acceptable Risk	
UCDE7	Use of Laboratory Ovens (General)	Acceptable Risk	
UCDE8	Use of Microwave Ovens (General)	Acceptable Risk	
UCDE9	Use of Sharps (General)	Acceptable Risk	
UCDE10	Use of Homogenisers (General)	Acceptable Risk	
UCDE11	Use of Hot Plates / Stirrers (General)	Acceptable Risk	
UCDE12	Use of pH Meters (General)	Trivial Risk	
UCDE14	Use of UV Light Sources	Acceptable Risk	
UCDE15	Gel Electrophoresis – Non-Chemical Risks (General)	Acceptable Risk	

UCDE16	Use of Laboratory Personal Protective Equipment	Trivial Risk	
UCDE17	Use of Microtomes (General)	Acceptable Risk	
UCDE18	Use of Laboratory Pumps (General)	Acceptable Risk	
UCDE19	Electrical Safety in the Lab	Moderate Risk	
UCDE20	Fire Safety in the Lab	Moderate Risk	
UCDE21	Manual Handling in the Lab	Acceptable Risk	
UCDE22	Laboratory Waste Disposal	Acceptable Risk	
UCDE23	Laboratory Personal Hygiene	Acceptable Risk	
UCDE24	Use of Water / Oil Baths (General)	Acceptable Risk	
UCDE26	Use of Wax Baths (General)	Acceptable Risk	
UCDE27	Use of Ice Makers (General)	Trivial Risk	
UCDE28	Dissection (General)	Acceptable Risk	
UCDE29	Use of Hand Sanitizers / Soaps (General)	Acceptable Risk	
UCDE30	Handling and Use Of Disinfectants (General)	Acceptable Risk	
UCDE31	Use of Lasers (General)	Acceptable Risk	
UCDE32	Use of Laboratory Analytical Equipment (General)	Acceptable Risk	

Radiation Safety Risk Assessments

These risk assessments may apply to persons working with radioactive materials within the School.

Risk Assessment Number	Title	Risk Rating	Comment
UCDG1	Handling and Use Of Radioisotopes (General)	Moderate Risk	

Fieldwork Risk Assessments

These risk assessments may apply to persons engaged in fieldwork.

Risk Assessment Number	Title	Risk Rating	Comment
UCDH1	Fieldwork (General)	Acceptable Risk	For general guidance purposes only. Reference should be made to the *UCD Fieldwork Safety Guidelines.* In some cases an expedition specific risk assessment will be required.
UCDH2	Leptospirosis (Fieldwork)	Acceptable Risk	
UCDH3	Home Visits – Face to Face Interviews	Acceptable Risk	

Workshop Safety Risk Assessments *These risk assessments may apply to persons working within any of the schools of Engineering*			
Risk Assessment Number	**Title**	**Risk Rating**	**Comment**
UCDK1	Use of Abrasive Wheels (General) Risk Assessment	Acceptable Risk	
UCDK2	Use of Band Saws (General) Risk Assessment	Acceptable Risk	
UCDK4	Use of Lathes (General) Risk Assessment	Acceptable Risk	
UCDK6	Use of Table Saws (General) Risk Assessment	Acceptable Risk	
UCDK10	Soldering (General) Risk Assessment	Acceptable Risk	
UCDK11	Use of Compressors (General) Risk Assessment	Acceptable Risk	
UCDK12	Use of Petrol - Diesel Fuel (General) Risk Assessment	Acceptable Risk	
UCDK13	Use of Compressed Air (General) Risk Assessment	Acceptable Risk	Refer to UCD Risk Assessment *UCDK11 Use of Compressors (General)* if necessary.

UCDK14	Use of Handheld Portable Electrical Tools (General) Risk Assessment	Acceptable Risk	The provisions laid down in *UCDA19 Electricity (General) Risk Assessment* and *UCDA14 Noise (General) Risk Assessment* should be adhered to where relevant.
UCDK15	Use of Handheld Tools (General) Risk Assessment	Acceptable Risk	
UCDK16	Use of Pallet Trucks (General) Risk Assessment	Acceptable Risk	
UCDK17	Use of Ladders (General) Risk Assessment	Acceptable Risk	
UCDK18	Use and Handling of Hydraulic Oil - Workshop Lubricants - Etc (General) Risk Assessment	Trivial Risk	
UCDK19	Dust (General) Risk Assessment	Acceptable Risk	
UCDK20	Vibration (General) Risk Assessment	Acceptable Risk	
UCDK21	General Plant and Equipment	Acceptable Risk	Where relevant the provisions contained within the following risk assessments must be adhered to: UCDA19 Electricity (General) UCDK19 Dust (General) UCDK20 Vibration (General)
UCDK22	Welding (General) Risk Assessment	Acceptable Risk	

18.0 Appendices

18.1 UCD Risk Assessment Templates

- Chemical Agents Risk Assessment Template
- Biological Agent Risk Assessment Template
- Nanomaterials Risk Assessment Template
- Machinery / Equipment Risk Assessment Template

- Fieldwork Risk Assessment Template
- Home Working Risk Assessment Template
- Lone Working Risk Assessment Template

18.2 UCD Checklists

- Self-Audit Checklist
- Lab Safety Checklists
    - Biological Safety
    - Chemical Safety
    - Equipment Safety
    - General
    - Housekeeping
    - Radiation

18.3 Emergency Response Posters

- Chemical Spill Response Poster
- Biological Spill Response Poster
- Fire Evacuation Poster

18.3.1 Chemical Spill Response Poster

CHEMICAL SPILLAGE / EMERGENCY RESPONSE

SDS for the chemicals in use within this lab are located at: _____

Chemical Spill response equipment is located at: _____

IF FIRST AID IS REQUIRED FOLLOWING A CHEMCIAL EXPOSURE

1. Contact local first aider: _____ ext. _____
2. The nearest first aid box is located at _____
3. First aid is also available via the UCD Emergency Line ext. **7999/ 01-7167999**
4. Refer to SDS for first aid response
5. Contact the SIRC Office (ext. 8768 / 8771) for further advice (if SIRC Office personnel cannot be contacted then contact the UCD Emergency Line on ext. 7999)
6. If necessary, contact the National Poisons Centre on 01 809 2566 (7 Days a Week: 8am – 10pm)

IN THE EVENT OF A CHEMCIAL SPILLAGE

MINOR SPILLAGE / LOW RISK CHEMCIALS

1. Isolate the spillage and evacuate the immediate area
2. Refer to SDS and UCD Chemical Safety Manual (www.ucd.ie/sirc)
3. Don appropriate protective equipment before dealing with spillage
4. For liquid spillages use absorbent materials and if necessary, booms to contain and absorb spillage. For spilled solids use a dustpan and brush to collect material whilst avoiding the generation of airborne dusts.
5. Dispose of waste material appropriately
6. If necessary, clean down affected surfaces and test for the presence of spilled material

MAJOR SPILLAGE (>~5 litres / kgs) / HIGH RISK CHEMICALS

1. Evacuate the area opening windows and closing all doors where possible
2. If fire or explosion is a risk activate the fire alarm by pressing a red wall mounted break glass unit
3. Contact the SIRC Office (ext. 8768 / 8771) for further advice (if SIRC Office personnel cannot be contacted then contact the UCD Emergency Line on ext. 7999).

18.3.2 Biological Agent Spill Response Poster

BIOLOGICAL AGENT SPILLAGE / EMERGENCY RESPONSE

Biological Spill response equipment is located at: _____

IF FIRST AID IS REQUIRED FOLLOWING A BIOLOGICAL AGENT EXPOSURE

7. Contact local first aider: _____ ext. _____
8. The nearest first aid box is located at _____
9. First aid is also available via the UCD Emergency Line ext. **7999/ 01-7167999**
10. Contact the SIRC Office (ext. 8768 / 8771) for further advice (if SIRC Office personnel cannot be contacted then contact the UCD Emergency Line on ext. 7999)

IN THE EVENT OF A BIOLOGICAL AGENT SPILLAGE

MINOR SPILLAGE / NO GENERATION OF AIRBORNE AEROSOLS

7. Isolate the spillage
8. Evacuate the immediate area
9. Don appropriate protective equipment before dealing with spillage
10. Treat the affected area with a dry disinfectant or else cover the area with a dry tissue or similar and apply a wet disinfectant
11. Allow enough time for the disinfectant to take effect
12. Collect the waste material and dispose of appropriately
13. Clean down affected surfaces again with a wet disinfectant and if necessary, test for the presence of spilled material

MAJOR SPILLAGE / GENERATION OF AIRBORNE AEROSOLS

4. Evacuate the area closing all doors
5. Contact the SIRC Office (ext. 8768 / 8771) for further advice (if SIRC Office personnel cannot be contacted then contact the UCD Emergency Line on ext. 7999)
6. Allow sufficient time for any aerosol to settle before re-entering the room.

18.3.3 Fire Evacuation Poster

SCIENCE COMPLEX
FIRE SAFETY NOTICE

IF YOU HEAR THE FIRE ALARM

1. Do not panic, but prepare to leave the building.
2. The alarm will sound continuously; leave the building immediately in an orderly fashion by following the green man running signs to the nearest exit. Please note that this may not be the same way that you entered the building.

3. Classes in session must be dismissed and students directed to leave.
4. Persons in laboratories and workshops should make the area safe before leaving by turning off equipment where possible and securing hazardous containers.
5. Do not use the lifts.
6. Do not go back to your working area for any reason.
7. If for any reason you are unable to leave the building make your way to a protected stairwell or a room with an external window and shut the door. If possible inform the emergency line (ext. 7999) or a colleague of your location and the reason you cannot safely exit the building.
8. Proceed to the nearest emergency assembly area to your point of departure from the building. The assembly areas for the Science Complex are:

   Car Park Beside Veterinary Science Cente **Beside the Lake (CSCB End)**

   In Front of the Church **Pedestrian Area in Front of Computer Centre**

9. Report any knowledge you may have of missing or injured persons to a *Fire Marshal* / Services Personnel.
10. Return to the building only after the *Chief Fire Marshal* / Services Personnel has given the all clear signal.

IF YOU OBSERVE A FIRE

1. Activate the fire alarm by breaking one of the red wall mounted break glass units located throughout the building and if possible inform the emergency line (ext. 7999).
2. If it is safe to do so and you have been trained to do so the fire may be tackled using a suitable fire extinguisher, but only if this does not place any person at risk of injury and you have a safe and clear means of escape from the fire at all times.
3. In the event that you cannot fight the fire or the fire begins to get out of control evacuate the area immediately