



SCHOOL OF BIOLOGICAL SCIENCES

HEALTH AND SAFETY HANDBOOK 2015-16

FOR EMERGENCY INFORMATION SEE INSIDE [PAGE](#) AND [PART 2](#) pp. 14-19

NOTE

Throughout this document, reference to “the College” means Royal Holloway, University of London. Similarly, reference to “the School” means the School of Biological Sciences of the College.

EMERGENCIES

FIRE

Activate the nearest call point (press centre) to sound alarm

Dial 444 (or 01784 443888) from an external line / mobile) to notify security who will call the fire brigade.

Leave the building by the nearest exit and report to your designated assembly point

EMERGENCIES OUT OF NORMAL HOURS

Do not place yourself at risk during any emergency situation.

FIRE

Activate the nearest call point (press centre) to sound alarm

Leave the building by the nearest exit.

Dial 444 (or 01784 443888) from an external line / mobile) to notify security who will call the fire brigade.

POLICE OR AMBULANCE (MEDICAL EMERGENCY)

Call 9-999

Call Security on 444 or 01784 443888. Give the location of the accident or emergency, the **building, level and a contact number.**

CRITICAL EQUIPMENT FAILURE OR FLOODING

Malfunction – i.e. cold room, -20°C room or flooding.

Call Security on 3063 or 444 if an emergency situation (i.e. personnel / building / equipment is at risk)

Note any contact numbers on equipment for contact with owners to be made.

Part 1

ROYAL HOLLOWAY, UNIVERSITY OF LONDON

SCHOOL OF BIOLOGICAL SCIENCES HEALTH AND SAFETY POLICY STATEMENT & ORGANISATION AND ARRANGEMENTS FOR CARRYING OUT THE POLICY

SECTION 1 – POLICY STATEMENT

1) The School sets out in this document its commitment for the provision of a safe and healthy environment and working conditions for staff and students, as well as to visitors and contractors working on its premises or in connection with its departmental activities.

2) The School attaches great importance to the proper management of health, safety and fire related risks (hereafter referred to as '*Health and Safety*'), treating them as seriously as other departmental objectives. This importance is reflected in the pro-active approach adopted to the management of health and safety and the implementation of College Policies and Procedures, School Codes of Safe Working Practice and the detailed arrangements established in this Health and Safety Policy. It is through such arrangements that the positive effects of this Policy and the identification of any further action required will be established.

3) The School's health and safety duties will be conducted in accordance with the requirements of the relevant statutory provisions and College Policies and Procedures, and in doing so the resources necessary to discharge such obligations will be made available. Staff, students, contractors and visitors to the School must meet their own legal responsibilities and not do anything that may prejudice the health, safety and welfare of themselves or others and co-operate with the Head of School to achieve the objectives contained in this Policy, College Policies and Procedures and the Schools Codes of Safe Working Practice.

4) In establishing this positive and progressive approach to health and safety, the School recognises the need for the support of staff and students and for them to be consulted and involved, particularly where allocated specific health and safety functions. An essential tool in this communication process is the School's Health and Safety Committee, which draws together management and staff to achieve the common objectives of a safe and healthy place of work and study.

5) Information, instruction, training and support will be provided to those charged with specific responsibilities under Section 2, subsections 1) and 2) below, and any other person charged with specific health and safety duties (for example, Manual Handling Assessors, Fire Marshals, etc.). Training will also be provided to those who may be subject to potential risks to their health and safety in order that they are able to competently recognise and manage such risks.

SECTION 2 – ORGANISATION AND ARRANGEMENTS FOR CARRYING OUT THE POLICY

1) The Head of School has overall responsibility for the management of health and safety. The post holder is supported in this task by the School's Health and Safety Co-ordinator(s). He/She has prime operational day-to-day responsibility for ensuring the health, safety and welfare of staff, and for meeting the specific requirements identified in this Policy, College Policies and Procedures and School Codes of Safe Working Practice, thereby facilitating the proper management of risk.

2) These departmental arrangements, as they relate to lines of communication and levels of responsibility, are detailed as follows:

The Head of School is accountable to the Dean of the Faculty of Science. He is advised by the College Health and Safety Advisors and is responsible for:

- i. Ensuring that School activities are conducted in accordance with College, legislative, and other relevant standards.
- ii. The production of safe systems of work and the procedures for carrying out this School's Health and Safety Policy;
- iii. Organising supervision to control the working environment and the maintenance of safety standards;
- iv. Investigating accidents with the object of establishing the cause and preventing recurrence, if necessary with the assistance of Health and Safety Office staff;
- v. Ensuring the safety induction of new staff and students and that information, instruction and training is provided to meet individually identified needs, if necessary with the assistance of a member of the Health and Safety Office;
- vi. Identifying, allocating and monitoring the adequacy of the specific health and safety responsibilities of staff and students and adjusting these as is identified necessary;
- vii. Identifying staff having health and safety duties and responsibilities, including the School's Health and Safety Co-ordinators, and the measures that may be necessary to ensure that their roles and responsibilities are met;
- viii. Producing the School's Code(s) of Safe Working Practice and effecting arrangements for their implementation on a day-to-day basis, where identified necessary by risk assessment.
- ix. Reviewing the above arrangements at appropriate intervals and making such adjustments as may be identified necessary.

Principal Investigators, Research and Technical Staff shall assist the Head of School with the responsibilities identified above by ensuring that their research, teaching and laboratory-based activities are conducted in accordance with both College and the School's Health and Safety Standards. Prior to the commencement of any new research or laboratory based activities, they must consider the health and safety implications, and where necessary, undertake risk assessments to ensure that associated risks are identified and appropriately controlled.

With respect to the supervision of postgraduate students, **PIs and supervisors** are responsible for assessing the risks of their work and ensuring their staff and students do likewise. They must ensure they carry out the following:

- i. Written risk/COSHH assessments of the work should be completed before each stage of the work commences.
- ii. The supervisor should regularly visit their students in the laboratory to ensure that they are working safely and to assess their practical ability.
- iii. Should the supervisor not be available for extended periods, an alternative supervisor must be arranged.

Further information can be obtained in:

["Responsible Research - Managing Health and Safety in Research"](#)

The [College Health & Safety Policy](#) on Health & Safety responsibilities of supervisors towards postgraduate and undergraduate students

Academics in charge of practical classes are responsible for the safety of the class; in particular they should

- i. Carry out a written risk/COSHH assessment for each practical;
- ii. Ensure all demonstrators understand and are able to carry out all the techniques used in the practical, and know how to deal with spillages and emergency situations.
- iii. Prevent any behaviour likely to impair safety;
- iv. Prevent obvious malpractice;

During practical classes, the academic responsible for the practical session must be present at all times. If the academic needs to leave the laboratory, practical work may only proceed if another academic, postdoctoral research worker or technician is present.

All members of Staff and Students in the School will co-operate and comply at all times with the safety information, instruction and training provided and bring without delay to the attention of the person they are directly accountable to (i.e. Principal Investigator, Manager, Supervisor, the School's Health and Safety Co-ordinator or School Technical Operations Manager) any hazards identified, or improvements they think necessary.

They do, therefore, have a duty to take reasonable care for the health and safety of themselves, and of other persons whom their acts or omissions may affect. They must co-operate with the Head of School to enable that person, or any other, to comply with any duty or requirement imposed by the Health and Safety at Work Act 1974, and any other relevant statutory provisions.

A School's Health & Safety Co-ordinator has been appointed and will:

- i. Assist the Head of School in the execution of the above duties;
- ii. Assist the Head of School in the production of safe systems of work and the procedures for carrying out this School's Health and Safety Policy;
- iii. Assist with the investigation of accidents with the object of establishing the cause and preventing recurrence, if necessary with the assistance of Health and Safety Office staff;
- iv. Assist with the safety induction of new staff and students and the provision of information, instruction and training to meet individually identified needs, if necessary with the assistance of a member of the Health and Safety Office;
- v. Assist in the production of the School's Code(s) of Safe Working Practice and arrangements for their implementation on a day-to-day basis, including where identified necessary by risk assessment.
- vi. Assist with the review of the above arrangements at appropriate intervals and in making such adjustments as are identified necessary.
- vii. Attend the College's Health and Safety Committee meetings so that the views and concerns of the School are brought to its attention and discussions and decisions of this committee are reported back;
- viii. Liaise and co-operate with their Head of School, and the College Health & Safety Office, in accident/incident investigations and health and safety audits;
- ix. Assist in the development of School arrangements which identify the action required in cases of emergency such as those related to fire, accidents or security issues.

The School will also appoint Deputy Health and Safety Co-ordinators to assist with the above.

The School Radiation Protection Supervisor

Has overall responsibility, under the guidance of the College Radiation Protection Officer, to ensure that all School activities involving ionising radiation are carried out in accordance with local rules. To authorise personnel to use radioactive material by way of a counter signature on the College Radiation Protection Personal Registration form. This will also include the identification of appropriate personal dosimetry, which shall be provided by the Health and Safety office. See College policies on [ionising radiation](#).

The School Biological Safety Officer

He/she assists the Head of School and the College Biological Safety Advisor with any work carried out within the School involving genetic manipulation or in which there is a biological hazard. The role of the officer and his/her duties are specified in the College Code of Practice for Genetic Manipulation.

3) THE SCHOOL'S HEALTH AND SAFETY COMMITTEE

The School's Health and Safety Committee will monitor and keep under review the measures taken to ensure the health, safety and welfare of staff, students and others engaged in legitimate activities of the School. The Committee will meet nominally four times a year, be chaired by the Head of School or his nominee, and minutes taken. Staff will be invited to submit items for discussion at each meeting.

Current Membership:-

School Health & Safety Co-ordinator (Chair): Ms E Turton
Clerical Representative and Minutes Secretary: Miss Carrie Hawkesworth
Director of Planning and Resources: Dr R Yanez
Deputy School Health & Safety Co-ordinator: Mr S Richards
Deputy School Health & Safety Co-ordinator: Dr. Chris Wilkinson
Deputy School Health & Safety Co-ordinator: [vacant]
Departmental Radiation Protection Supervisor: Mr C Gerrish
Deputy School Radiation Supervisor: Dr Simona Ursu
School Biological Safety Officer (BSO): Dr C Wilkinson
Deputy BSO: Ms Elaine Turton
Academic Representatives: Prof. M Brown, Prof. Paul Fraser, Dr. Rafael Yanez.
Research Staff Representative: [vacant]
Postgraduate Representative: Mr Andreas Ebertz

4) The Management of Risk at School Level

The proper management of risk at School level requires the production of written health and safety standards, which identify areas of potential risk and clarify the process by which activities will be performed in order that they can be executed safely. This will include activities, curricular or extra-curricular and the planning and execution of field trips, expeditions and visits, as well as school visits to the College.

Properly conducted risk assessment is an essential feature of the effective management of risk. At each management level, risk assessment will be an invaluable tool in the allocation of resources by ensuring that these are apportioned according to the level of risk identified.

All personnel are required to ensure adherence to the School's Codes of Safe Working Practice, including those that may be applicable to activities that are conducted outside of the College. They should bring any instances where this may not be possible to the attention of their Line Manager at the earliest opportunity, in order that effective remedial action may be taken.

5) Health and Safety Information

Comprehensive information, including copies of Health and Safety Executive publications relating to subjects likely to be relevant to the School's activities, is available for reference in the Health and Safety Office and should be requested through the School's Health and Safety Co-ordinator.

REVIEW OF THE POLICY

The implementation of this Policy and the requirements of College Policies and Procedures and the School's Codes of Safe Working Practice, will be reviewed during a formal health and safety audit conducted by the College's Health & Safety Officer (Auditor), at least twice within a three year cycle using the College's standard audit questionnaire.

Where the activities of the School are felt to warrant more regular auditing, an appropriate frequency will be identified and agreed with the Head of School. School staff tasked with specific health and safety responsibilities will, in accordance with the relevant statutory provisions and College Policies and Procedures, carry out a review of School arrangements at the required/specified

interval. Signed by the Head of School on 1st September 2015.



Dr. Dave Morrith.

HEALTH AND SAFETY PERSONNEL

SCHOOL OF BIOLOGICAL SCIENCES - Contacts

		Location	Extension
HEALTH AND SAFETY CO-ORDINATOR	Ms E Turton	Bourne 513	3391
TECHNICAL OPERATIONS MANAGER			
DEPUTY HEALTH AND SAFETY COORDINATOR/S	Mr S Richards (technical)	Bourne	3374
	Dr C Wilkinson (academic)	Bourne	3778
SCHOOL BIOLOGICAL SAFETY ADVISOR	Dr. C Wilkinson	Bourne	3778
SCHOOL RADIATION PROTECTION SUPERVISOR	Mr. C Gerrish	Bourne	3895
COLLEGE BIOLOGICAL SAFETY ADVISOR	Contact through H&S office		
COLLEGE RADIATION PROTECTION OFFICER	Mr M Purcell		3828
COLLEGE LASER SAFETY OFFICER	Mr A Alway (Physics)	Tolansky	3483
COLLEGE FIRE SAFETY OFFICER	Mr A Oakes		4641
COLLEGE DIRECTOR OF HEALTH AND SAFETY	Mr M Purcell		3828
COLLEGE HEALTH CENTRE	Founders	FE 171	3130

SOURCES OF ADVICE AND INFORMATION

The following can offer advice: The College Health & Safety Advisor (ext. 3029)
The School Health & Safety Co-ordinator (ext. 3391)
The Departmental Radiation Protection Supervisor (ext. 3895)

The following Regulations, Guidance Notes and Codes of Safe Working Practice are available from the College Health & Safety Advisor or School Health & Safety Co-ordinator:

The College Health & Safety Policy Statement and Organisation and Arrangements for carrying out the policy

The College [Health & Safety Office Website](#)

The [Health & Safety at Work etc Act 1974](#).

The Workplace (Health, Safety & Welfare) Regulations 1992 – [Approved Code of Practice and Guidance](#).

Control of Substances Hazardous to Health Regulations 2002 (as amended) – [Approved Code of Practice and Guidance](#). 6th edition

[EH 40/2005 – Workplace Exposure Limits](#) – containing the list of workplace exposure limits for use with the COSHH Regulations 2002 (as amended)

Dangerous Substances and Explosive Atmospheres Regulations 2002 ([DSEAR](#)) – [Approved Code of Practice and Guidance](#).

[‘Work with Ionising Radiation’](#) (Ionising Radiation Regulations 1999) – Approved Code of Practice and Guidance

Radioactive Substances Act 1993 ([RSA93](#)).

Pressure Equipment Regulations 1999, Pressure System Safety Regulations 2000, [Safety of Pressure Systems, Approved Code of Practice](#)

Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2004 [HSE guidance](#)

Safe Handling and Use of Cryogenic Liquids – Code of Practice (Royal Holloway)

[Genetically Modified Organisms \(contained use\) Regulations 2014](#) and [associated guidance](#)
[Guidance on Health and Safety in Fieldwork](#), UCEA/USHA, May 2011.

[Guidance Note: A Safe System of Fieldwork, NERC 1983](#).

[The Waste \(England and Wales\) \(amendment\) Regulations 2011](#)

The Health & Safety (Safety Signs and Signals) Regulations 1996. [Guidance on Regulations](#)

Maintenance, Examination and Testing of Local Exhaust Ventilation (2nd Ed.) 1998.

Manual Handling Operations Regulations 1992 (as amended) - [Guidance on regulations](#).

[Personal Protective Equipment at Work Regulations 1992](#) (as amended).

Safe Use of Equipment - Provision & Use of Work Equipment Regulations (PUWER) 1998 – [Approved Code of Practice and Guidance](#)

[Work with Display Screen Equipment](#) - Health & Safety (Display Screen Equipment) Regulations 1992 (as amended) – Guidance on Regulations.

Controlling Noise at Work - The Control of Noise at Work Regulations 2005 – [Guidance on Regulations](#)

College Safety Policy in Relation to the Use of Lasers 2001.

Scientific Advisory Committee on Genetic Modification (SACGM) [Compendium of guidance.](#)

Guidance documents from the HSE & Advisory Committee on Dangerous Pathogens (ACDP)

[Biological agents: Managing the risks in laboratories and healthcare premises](#)

[HSE: Biosafety](#)

SCHOOL OF BIOLOGICAL SCIENCES HEALTH & SAFETY CODE OF PRACTICE

This Code has been drawn up in the interests of all who work in the School and members of the general public who may be affected by its work. The Code is supplementary to the current College Statement of Health & Safety Policy and the School's Health and Safety Policy Statement & organisation for carrying out the policy and is intended to meet or exceed the safety standards set by the Health and Safety at Work Act, 1974 including the Control of Substances Hazardous to Health Regulations, 2002, and the Health and Safety at Work Regulations 1999.

The Code is in three parts:-

Part 1 Health and Safety Policy Statement and Organisation and Arrangements for carrying out the Policy.

Part 2 Emergency and Fire Procedures

Part 3 Procedures, Guidance Notes and Training Requirements

As a member of the School, you have a legal duty to yourself and your colleagues to work in a safe manner, and not to put others at risk by your actions. You may be barred from working in all or part of the School's premises if you fail to observe the Codes. Members of the School with disabilities which could lead to self-injury or injury to other members of the School must inform the Head of the School of Biological Sciences of the nature and extent of these, to enable support and assistance in the event of an emergency.

SCHOOL OF BIOLOGICAL SCIENCES HEALTH AND SAFETY INDUCTION PROCEDURE

ALL STAFF AND POSTGRADUATE STUDENTS *MUST ATTEND* a school health and safety induction so far as reasonably practical conducted on the first day of employment.

This will be carried out using the college's departmental health and safety induction check list. At this induction you will receive information on the above along with information on the schools health and safety procedures.

See SI P1: The Schools Health and Safety Induction procedure

The Induction will be undertaken by

New Academic Staff- Health and Safety Coordinator

New Technical Staff- Health and Safety Coordinator

New Clerical Staff- Senior Faculty Administrator

New research staff or postgraduate students

PMS Safina Khan, Chris Gerrish

BMS Elaine Turton

EEB Elaine Turton

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Part 2: EMERGENCY AND FIRE PROCEDURES

2.1 FIRE SAFETY TRAINING

All college staff are required to undertake periodic online fire safety training covering basic fire safety. You should have been shown your evacuation routes during your safety induction; if not see the School's Health and Safety Co-ordinator.

Staff must insure all their visitors have been given information on fire safety measures that may affect them while they are in the School.

See *SIP1 Schools health and safety induction procedure*

The School has trained, designated Fire Marshals with responsibility for ensuring the evacuation of a specific part of the Bourne or Wolfson Buildings in the event of a fire alarm.

The up-dated list of Fire Marshals across the can be found on the [College Health and Safety pages](#)

Bourne Level 5:

Ms E Turton
Mrs N Moss

Bourne Level 4:

Mr N Morley
Mr K Liu

Bourne Level 3:

Mr C Gerrish
Mr S Richards
Mr B McCrea

Bourne Level 2:

Mrs P Baker

Bourne Level 1:

Mr R Prouse

Wolfson Level 3:

Dr. L Popplewell

Wolfson Level 4:

Ms E Popescu
Ms N Sanderson

2.2 TESTING OF THE FIRE ALARM

Building	Day	Time	Designated Assembly point
Bourne	Thurs	11am	Exit top: 26; Exit top without steps: 11; Exit bottom: 15
Bourne Annexe	Thurs	11am	15 or 11
Munro Fox incl. Seminar Room	Thurs	11am	26
John Bowyer	Wed	2pm	15
Wolfson	Wed	9.45am	15

A full schedule of fire alarm testing around the College can be found on the Fire Safety Pages of the College's Health and Safety web site.

2.3 FIRE EVACUATION PROCEDURES

IF YOU DISCOVER A FIRE

YOU MUST

- Operate the nearest alarm call point
- Dial 444 (or 01784 443888) from an external phone or mobile to notify security, who will call the fire brigade.
- Leave the building by the nearest exit
- Report to your designated assembly point.

WHAT TO DO ON HEARING THE FIRE ALARM

YOU MUST

- Leave the building by the nearest route.
- If possible, turn off apparatus using gas, water or electricity in the immediate area, close the doors behind you.
- Report to your designated assembly point.
- Do not return to the building until authorised to do so.
- Do not use the lifts.

NOTE

There are separate fire alarm systems in Bourne and Wolfson. If the alarm goes off in Wolfson, this building should be evacuated, but not Bourne, and *vice versa*.

The **DO NOT ENTER** illuminated signs above the doors on the 2 bridges between Wolfson and Bourne will light up in the event of an alarm activation in either building.

Make sure you know:

- The fire procedures – see [“Emergencies”](#) and [“Emergency & Fire Procedures”](#)
- Location of your nearest fire activation / call point
- All available exit routes
- Location of assembly points
- Location of fire extinguishers, blankets and how to use them – **ONLY** if you have been trained to do so.

Fire doors should be kept closed but not locked except when in use.

If a fire door needs to be propped open to move equipment for example, individuals involved must ensure the fire door is closed immediately afterwards.

Individuals who leave fire doors propped open are endangering lives and may face disciplinary action.

2.4 IN THE EVENT OF A SERIOUS INJURY OR MEDICAL EMERGENCY

PROCEDURE FOR REQUESTING AN AMBULANCE

- Dial 444 (or 01784 44388 from an outside line or mobile) to notify Security who will call for an ambulance.
- State the location of accident or medical emergency (building and level).

If possible, arrange for one person to await the arrival of the ambulance at the main entrance to the building.

In case of dialling 9-999 direct

- Contact security on 444 (or 01784 44388 from an outside line or mobile).
- State the location of accident or medical emergency (building and level).

If possible, arrange for one person to await the arrival of the ambulance at the main entrance to the building.

NOTE: dialling 444 first is the accepted College Procedure for requesting emergency assistance.

2.5 FIRST AID

See FA1 School risk assessment for the provision of first aid

First Aid boxes are sited throughout the building

If an item needs restocking, please tell the School Health & Safety Co-ordinator.

Monthly checks are made of all first aid boxes by a school first aider.

Notices are displayed throughout Bourne listing the nearest First Aid trained members of staff to that location.

The nearest hospital casualty (A&E) department is: **St Peter's Hospital, Chertsey KT16 0PZ**

The nearest walk-in centre (08:00 - 20:00) is: **Ashford Hospital, London Road, Ashford TW15 3FE**

School first aiders are as follows:

Name	Room	Telephone ext.
Ms E Turton	BL513	3391
Prof. J Koricheva	BL507	3414
Mr S Richards	BL303	3374
Mrs Pauline Baker	BL202b	3775
Mr Kel Liu	BL201e/438	3396

Make sure you know:

- Location of your nearest first aiders
- Location of your nearest first aid kit
- Location and number of your nearest telephone (if not in your office/work area.)
- The emergency contact numbers for the Security Office
- Where the accident forms are kept and when you should complete one.

2.6 SPILLAGE OF HAZARDOUS LIQUIDS

Make sure no person is in immediate danger.

Flammable liquids

- Turn out all flames.
- Do not turn on or off electrical appliances.
- Warn people nearby of the hazard and ask them to leave the area.
- As soon as possible inform a member of the technical staff.
- Complete an incident/accident form.

Corrosive liquids

- Use appropriate protective clothing when handling.
- In the case of spillage, warn others of the hazard and as soon as possible inform a member of the technical staff.
- If you know how to do so use a spill kit to contain the spillage.

Microorganisms

See Spill 1 the School's emergency procedures for the spillage of microorganisms.

- **Small volume spills (less than 100mls)** of micro-organisms should be covered immediately with paper towel to prevent the generation of aerosols. Then pour on the disinfectant and leave to stand for 15 minutes. Disinfectants that may be used are listed below but *Distel* (formally called TriGENE) should be the first choice. Place the paper towel in autoclave bags for inactivation by autoclaving.
- **Large volume spills (greater than 100mls) of** micro-organisms should be immediately absorbed by using paper towel and granular material or a 3M disposable Spill Kit. Care should be taken not to create aerosols by violently disturbing the spill. When all the liquid has been absorbed, carefully place all contaminated materials in an autoclave bag to be inactivated by autoclaving.

The contaminated surface can then be disinfected with one of the agents below but *Distel* (formally called TriGENE) should be the first choice. The contaminated paper towel is then added to the autoclave bag to be inactivated by autoclaving.

- **Major accidental spillage (>500ml) of any class 2 GM or hazard group 2 biological agents:**
All workers in the vicinity must be notified and the hazardous area must be cleared immediately. Contaminated clothing must be removed taking care not to spread the contamination or become contaminated further.
The contaminated clothes should be placed in an autoclave bag and sent to be autoclaved. Follow the procedure for large volume spills as above.
In the case of a major spillage, of Class 2 organism an incident report must be completed and sent to the Schools Biological Safety Officer

2.7 APPROVED METHODS OF DISINFECTION

Check the microbiological efficacy of the disinfectant for your organism before you use any disinfectant.

Ensure adequate contact time for effective disinfection.

Distel (formerly called TriGENE advance) disinfectant based on nano particulate technology enabling the active ingredients to be carried rapidly through the cell walls of microorganisms.. Available as ready to use spray diluted to 1:100 or as concentrate for dilution to act as a wide spectrum disinfectant for hard surfaces.

[Distel recommendations: dilution of: 1:200 for general pre cleaned areas 1:100 for heavy soil and high risk areas 1:10 in the presence of blood and bio-hazard spillage.]

Proven to have a wide range of bactericidal, mycobactericidal, virucidal and fungicidal properties, it is suitable for use on most surfaces including glass, metal, plastic, rubber and fabric.

Virkon powder: peroxygen compound proven to have a wide range of microbial, antiviral and antifungal activity. Active agent is potassium monopersulphate. Contains anionic surfactant. Use as 1% solution; stable for 7 days.

Presept tablets: Composition: sodium dichloroisocyanurate (NsDCC), a precursor of hypo-chlorous acid in an effervescent base.

Use one tablet into 1 litre of water giving 1400ppm available chlorine. Acts as a wide spectrum disinfectant solution for hard surfaces; effective against all vegetative bacteria, fungi, viruses and bacterial spores.

This disinfectant may only be used if Distel and Virkon do not destroy the organism being used.

NOTE: Presept and Virkon disinfectant must be dated when made and renewed weekly.

See School procedures: Spill 2 Procedure for breakages or suspect breakages and spillages of microorganisms in a shaker.

Spill 3 Procedure for breakages or suspect breakages and spillages of microorganisms in a centrifuge.

[Radioactive liquids: Section 3.9\(a\)](#)

It is essential that a College Accident/Incident Report Form is completed for all accidents and incidents, irrespective of whether injury results or notification is required to be made to the Health & Safety Executive.

These accident/incident forms are available from the School Health & Safety Co-ordinator, Steve Richards in 303 or the head of Schools PA.

Spillage kits are available within easy reach of each research and teaching laboratory.

2.8 TURNING OFF SERVICES: ELECTRICITY, GAS AND WATER.

Estates Department are responsible for turning off and restoring these services.

In an emergency the technical staff have the authority to close down these services. Campus Services **MUST** be informed if this is to be done.

Part 3: PROCEDURES, GUIDANCE NOTES AND TRAINING REQUIREMENTS

3.1 GENERAL SAFETY RULES

ALL LABORATORY WORK must be carried out in accordance with the school and PI procedures and risk assessments.

No person is permitted to carry out work of a hazardous nature in the laboratory unless there is another person within the laboratory

See LWP1 SBS lone and out of hours working policy and procedure

Instructions from the Head of School, School Health and Safety Coordinator and College Health and Safety advisors must be followed. Failure to follow School and College Safety procedures can result in the individual being prevented from working on the School premises.

Personal I-pods must not be used in the laboratories where they prevent hearing fire alarms, spoken instructions or present a noise disturbance to other workers.

Radios may not be used unless all workers consent to their use.

Mobile phones may not be used in the lecture rooms or teaching laboratories in Bourne or Wolfson.

Gas (including cylinder gases), electricity and water supplies must not be left on and unattended unless marked "PLEASE LEAVE ON" with clear, concise instructions how to turn off in the event of emergency.

Every precaution must be taken to ensure appliances are safe to be left switched on and unattended.

All equipment left on permanently or experiments set to run overnight/weekends should be marked with a yellow "Please leave on" card.

The details should be completed on the card and it should be signed.

Cards can be obtained from the School Health and Safety Coordinator.

Glasshouse fumigations: clear notices must be posted at the entrance when glasshouses are fumigated. Date, time and type of fumigant must be on the notice.

Driving and Vehicles:

See the [College Driving and Vehicle Safety Policy and Procedure](#)

Only persons who have completed Driver Declaration and/or driver Approval Form to achieve approved driver status are allowed to drive the School vehicle. A list of persons with the approved driver status is held by the Technical Operations manager. All risks associated with driving the departmental vehicle must be assessed and the drivers competent to drive the vehicle must be established.

No pets may be brought into the Bourne Building unless in exceptional circumstances with the prior permission of the Head of School.

No personnel are permitted in any laboratory or workshop without permission from the School Health and Safety Coordinator or the technical or academic staff responsible for those areas.

No personnel are permitted to use the dark room unless trained by a competent person

See DRP1 School procedure for the use of the dark room

3.2 LABORATORY HOUSEKEEPING

See HKP1 Schools code of practice for laboratory housekeeping

Good housekeeping is the foundation of good practice essential for a clean safe and healthy workplace. It is imperative that good housekeeping practices are employed so that the likelihood of accidents and injuries is minimised. Maintaining high standards of housekeeping conveys a sense of professionalism to those who visit and work in the School.

Housekeeping is the responsibility of the PI for their research laboratories and associated areas and of the Technical Operations Manager for the Teaching laboratories and those laboratories associated with central and core services. A housekeeping regime must be organised and PIs must ensure that staff and students work to this code of practice in their areas of responsibility

Food or drink is not permitted to be stored in laboratory refrigerators or deep-freezers.

Mouth pipetting must not be carried out.

There must be no eating, drinking or application of cosmetics in the laboratories.

Laboratory “dress code”:

Laboratory coats should be worn at all times in the laboratory.

Laboratory coats must not be worn in communal office or social areas, such as the postgraduate writing rooms, photocopy rooms, foyer, the pantry or Alice room.

Footwear: closed **shoes** should be worn in the laboratory (flip flops **MUST NOT** be worn), gloves should only be worn in the laboratory when it is necessary for the protection of the worker or the work. Laboratory coats and gloves should be removed on leaving the laboratory. It is essential to wear suitable eye protection in the laboratories when carrying out any hazardous experimental work.

Gloves: Disposable laboratory gloves must never be worn outside laboratories. Material that is hazardous on contact with the skin and it needs to be used in another part of the building, e.g. dark room, gel doc system, must be transported in a sealed container to prevent spillage on the floor or onto you or other people.

Bench tops: at all times should be kept clean, organised and free of debris, equipment and chemicals not currently in use.

Laboratory floors and foot-wells: should be free from obstructions, be clean and dry. All spills should be dealt with immediately to prevent slips and trips and the risk of contamination as laid down in School procedures.

Fire emergency exit routes should be kept clear, particularly in corridors.

Storage: Reagent shelves in the middle of benches, chemical storage cupboards, fridge and freezers, must be kept orderly and free from spillages, using containment trays where possible.

Ensure all stocks of solutions and samples are **labelled correctly with contents and your name**; avoid using abbreviations or shorthand which may not be understood by other laboratory users. All solutions and chemicals should be stored with their label to the front and labelled in English. Dispose of old, unwanted solutions regularly and always when you have finished an experiment.

See Chem P4 School procedure for the safe disposal of chemical waste

Heavy items should only be stored on the lowest shelving, no higher than bench height, with lighter items on higher shelves. Do not overload or unevenly load shelves, increasing the likelihood of the items falling to cause injury or damage to people, equipment or experiments.

Tops of -80 freezers and fume hoods must not be used as storage locations.

Ladders: the correct step or ladders should be available to reach items above shoulder level

See The College's Policy and Procedure for working at height.

Waste:

Each lab should have designated bins **for broken non-contaminated glass**; these should only be filled to the fill line and then be disposed of safely and promptly.

Biohazard bags should be held in holders or small bins; when $\frac{3}{4}$ full they must be transferred to designated boxes to ensure any spillages are contained.

See CSP1 Schools procedure for the safe storage and collection of waste for autoclaving

Sharps bins containing biological hazard waste once filled to the fill line, must be disposed of safely and promptly.

See Chem P4 School procedure for the safe disposal of chemical waste

Cleaning/Wash-up: Designated boxes should be available in the laboratory for **washing up**; returned clean glassware should be stored away in the laboratory as soon as possible

See CSP4 School procedure for safe storage and collection of glassware for washing up

Work areas and equipment: should be left in a safe condition after use. Turn off all equipment if not in use and ensure it is clean.

If using microorganisms, wipe down benches and Class II hoods with appropriate disinfectant after each procedure or immediately following a spill.

Keep the area around balances free from spills.

Before any equipment is passed on to outside contractors or the College's Campus services team for repair it should be carefully decontaminated of any harmful agents and marked accordingly.

Microorganisms: If using microorganisms the appropriate disinfectant should be available at all times in the laboratory. Distel (formally called Tri-GENE) is the school's first choice disinfectant as a

ready to use spray or as a concentrate for dilution. If using Virkon or Presept these must be dated when made and renewed weekly.

See Spill P1 Schools Procedure for Emergency Spillages of Microorganisms
[Section 2.7 Approved Methods of Disinfection](#)

Chemicals Large amounts of solvents should be stored in the outside solvent store; no more than one Winchester of each liquid chemical must be stored in their respective designated cabinets. **Only one** Winchester of each **waste chemical** should be kept in the laboratory.

Chemicals should not be stored on the floor.

Promptly and safely dispose of all waste, unused or old chemicals as recommended in the School's procedures. Contact Rob Prouse or Steve Richards for advice if you are unsure how to dispose of a substance.

See Chem P4 School procedure for the safe disposal of chemical waste

DO NOT store flammable solvents in non-spark proof fridges

See Chem P2 Schools procedure for the purchase safe storage and use of chemicals under REACH and COSHH.

Fume Hoods: should not be used for the storage of chemicals or equipment unless in use.

Gas Cylinders All compressed gas cylinders must be securely strapped to the wall or placed in stands to prevent them from falling over.

Cylinders must be easily accessible for changing and maintenance.

Hand-wash and hygiene:

Ensure **paper towels and soap** are available at wash hand basins. These are available from Stores.

Wash your hands regularly when working with chemical or biological agents.

Gloves are not a substitute for high standards of laboratory hygiene.

3.3 RISK ASSESSMENTS

Under the Management of Health and Safety at Work Regulations 1999, **all** work activities must be assessed for risk.

Defining hazards and risks

It is important to understand the differences between hazards and risks if you are to be sure of addressing those areas in which harm to individuals may arise and the likelihood of that resulting in injury or ill health.

Hazard – something with the potential to cause harm.

Risk – the probability (or likelihood) of harm occurring in the actual circumstances of use.

To evaluate the extent of a risk, we consider the frequency with which harm may occur and the severity of the consequences.

See the College [Guide to Conducting 'General' Risk Assessments](#) and associated documents on the [College Health and Safety Pages](#).

Various technical regulations require **specific risks** to be assessed before particular operations commence. Those which are relevant to the School's activities are:

The Ionising Radiations Regulations 1999 (IRR99)

The Control of Substances Hazardous to Health Regulations 2002 (as amended)

L5 Approved Code of Practice and Guidance (ACOP) Fifth Edition

EH40/2005 Workplace Exposure Limits

The Health and Safety (Display Screen Equipment) Regulations 1992

The Manual Handling Operations Regulations 1992

The Personal Protective Equipment at Work Regulations 1992

The Genetically Modified Organisms (Contained Use) Regulations 1992, 2000

The working at height regulations 2005

Those activities that do require particular skills to undertake them have their own systems of assessment and are to be found in the following College documents:

The College Policy Control of Substances Hazardous to Health Guidance documents

Manual Handling Operations Regulations Policy and Procedure

Health and Safety Display Screen Equipment Regulations Policy and Procedure

Radiation Protection Policy and Procedure documents

Work at height policy and procedure

Laser Safety Policy and Procedure

Lone Working Policy and Procedure

Safe Handling and use of Cryogenic Liquids

Personal Protective Equipment Policy

Driving and Vehicle Safety Policy

Maternity and the Risk Assessment process

Note: Only those personnel who have undergone a formal programme of risk assessment training may undertake risk assessments on behalf of the School.

All practical work (laboratory-based research, fieldwork, undergraduate research projects, undergraduate practical classes) may only be conducted after a risk assessment has been carried out.

Advice concerning risk assessment may be obtained from the School Health & Safety Co-ordinator, and from the College Health & Safety policy statement "Guide to conducting risk assessments".

In the case of undergraduate classes and independent projects, the risk assessment will have been made by the supervising member of academic staff annually.

For research projects, risk assessments made by the supervising member of academic staff will be conducted with the participation of those carrying out the work and must be renewed annually or more frequently as required. In such assessments, all potential hazards will be evaluated and either the work may be carried out within this School's Code of Practice or else appropriate additional safety procedures must be prepared in writing. Such procedures must be designed in all cases to prevent exposure of laboratory personnel to hazardous substances or other hazards.

All risk assessments must be signed by the PI (academic supervisor) responsible for the project who must ensure that all appropriate research workers have signed to say they have read and understood them and will comply and follow the agreed procedures. The PI must ensure that training is provided and recorded to enable the research worker to competently carry out these risk-assessed tasks.

In the case of undergraduate classes, any unusual or additional safety procedures must be included in the laboratory manual or laboratory schedule. Any practical work which has not been subject to risk assessment must not be carried out.

Where a risk assessment identifies a hazard and thus requires special precautions, a Standard Operating Procedure or a Safe Working Practice must be produced by the PI, supervisor or manager in which the appropriate precautions are fully described at the relevant stages. The PIs, supervisors or managers must ensure this procedure or code of practice has been read and understood by the end user and that they have received documented training by a competent person. No departure from the protocol, for example scaling-up, is permissible without conducting a new risk/COSHH assessment.

3.4 PERSONAL PROTECTIVE EQUIPMENT

Under the Personal Protective Equipment at Work regulations (1992), PPE should be regarded as the last resort to protect oneself against risks to health and safety. PIs, supervisors and managers in the School must ensure that when carrying out a risk assessment consideration is first given to the use of safe systems of work.

The following principles for controlling risk should, therefore, be applied, preferably in the following order:

Use a less risky option;

Prevent access to the hazard;

Reduce exposure to the hazard for example adapting work practice to work in a fume hood;

If, after all the above, there is still a residual risk, provide appropriate PPE and ensure all users understand their obligations to use it and that it is correctly used.

Once it is established that PPE is required **it is the responsibility of each PI, supervisor or manager to select and provide the Personal Protective Equipment** which is correct for the particular risks involved and for the circumstances of its use. This should be achieved through a risk assessment.

To carry out this risk assessment and further information on the care and use of PPE:

See PPE 1 Schools Personal Protective Equipment Policy.

FACE MASKS/RESPIRATORY PROTECTION EQUIPMENT (RPE)

If the risk assessment of a procedure or the use of a substance shows the need for a face mask, the following procedure must be followed.

All new users will be required to undergo a face-fit test. Face-fit testing will only be conducted by a suitably experienced tester using an approved procedure. Results of the tests (if required) will be provided to the Health and Safety Co-ordinator with copies passed on to the user and their PI or manager. The test results will be kept by the Health and Safety Coordinator or the BSU senior technician.

Face-fit tests will be repeated in the following circumstances:

Where the wearer:

Loses or gains significant weight or has facial surgery

Undergoes any substantial dental work

Develops any facial changes (scars moles etc.) around the face seal area

or there is a change in College policy on RPE

Until the test is carried out, a vented hood must be worn (RPE); see Emma Popescu for information on these units.

Maintenance and Storage of Personal Protective Equipment

PIs supervisors and managers **have the responsibility** to ensure:

- That all PPE is maintained in working order and in good repair.
- That they have an effective maintenance system for each type of PPE, which includes the following:

Follow any manufacturers recommended maintenance schedule that comes with the PPE including recommended replacement periods and shelf lives.

- Examination - checking for faults, damage, wear and tear, dirt, etc.
- Testing - to ensure PPE is operating as intended. Cleaning, including disinfection where appropriate.
- Repair.
- Replacement
- Have written procedures in place for the maintenance and the frequency of that maintenance that must be followed by the users.
- Keep records of tests and examinations of the PPE.

Information, instruction and training

PIs, supervisors or managers **have the responsibility** to ensure:

- That the users are provided with information, training and instruction in the correct use of the PPE, and this should be carried out in accordance with any recommendations and instructions supplied by the PPE manufacturer. Records of all training must be kept.
- That everyone who is required to wear PPE is competent to do so.
- That the users have adequate supervision and are checked regularly to see that PPE is properly used and is being worn, and they should investigate fully if it is not being worn.

Reporting loss or defect.

PIs, supervisors and managers must ensure that staff and students within their area of responsibility report loss or defects in their PPE; you should provide:

- A **procedure** for reporting the defect.
- A **person** to report the defect to who will then ensure that the PPE is repaired or replaced before the user concerned recommences work.
- A suitable **replacement PPE** that is readily available.

Persons who are required to wear PPE must:

- Take **reasonable care** of the PPE
- **Comply** with the above requirements.
- **Report** any loss or obvious defect as soon as possible.
- **Report immediately any concerns** about the serviceability of the PPE to their PI, supervisor or manager.

It is essential that the appropriate items of safety clothing and safety equipment are worn or used during practical work.

Laboratory coats must be worn by all staff and students at all times in all the teaching and research laboratories. Safety spectacles must be worn at all times in the laboratories in which hazardous chemicals or equipment presenting mechanical hazards are used.

Additional protective clothing and/or equipment (such as face shields or gloves) must be worn if warranted by the risk or COSHH assessment, [see 3.5\(a\) Chemical Hazards.](#)

Reminder: Laboratory coats must not be worn in communal office or social areas, such as the postgraduate writing rooms, photocopy rooms, foyer, the pantry or Alice room.
Disposable laboratory gloves must never be worn outside laboratories.
Material that is hazardous on contact with the skin and needs to be used in another part of the building, e.g. dark room, gel doc system, must be transported in a sealed container to prevent spillage on the floor or onto you or other people.

3.5 GENERAL HAZARDS

a. Chemical Hazards

See Chem P1a School's procedure for completing COSHH assessments
Chem P2. Procedures for the purchase safe storage of use under REACH and COSHH

The use and disposal of hazardous chemicals are controlled by COSHH (Control of Substances Hazardous to Health) 2002 regulations. Refer to the College [COSHH Policy and Guidance document](#).

Many of the chemicals and solvents in general use constitute a hazard if used carelessly. Before using a hazardous chemical, ensure that you are aware of its hazardous properties and the precautionary measures to be taken. A COSHH assessment must be carried out before a new substance is introduced into the School.

It is important that you know exactly what to do in an emergency and have appropriate antidotes available where needed.

Commercially supplied bottles of hazardous chemicals are labelled under the new Global Harmonised Labelling System (GHS), using the appropriate pictogram within a red diamond on a white background, along with H (Hazard) and/or P (Precautionary) number replacing the older risk and safety numbers.



There is not a direct correlation between the new and old system, do not assume there is. As there may be older reagents still in use in laboratories using the old system of a pictogram on an orange background, along with the R and S numbers, ensure that the present Material Data Safety Sheet and CoSHH form is checked before using and always again when new, replacement reagents are acquired.

By 2015 the only labelling system being used in the School will be will the Global Harmonised System (GHS)

To carry out a COSHH assessment:

Refer to the College [COSHH Policy and Guidance document](#) and the various documents associated with CoSHH on the [College Health and Safety Pages](#).

Note: Only those personnel who have undergone a formal programme of CoSHH assessment training may undertake assessments on behalf of the School. Forms may be compiled provided they are checked by training personnel before being made available for use.

PIs Supervisors Managers

Have the responsibility to implement the requirements of the College CoSHH Policy and Guidance and School CoSHH performance standards, within their area of responsibility. They must ensure that CoSHH assessments are undertaken, that their requirements are met on a day-to-day basis and will

bring instances in which this may not be possible, or where difficulties are encountered, to the attention of the School's health and safety co-ordinator. They must also ensure members of their team or research group are trained (training to be recorded) and are competent in the handling and disposal of all chemicals utilized in their group. All bottles of solvents and solutions MUST be clearly labelled and any potential hazards clearly indicated.

Undergraduate students must be warned of the potential danger of any material they may be using in practical classes verbally before a practical and through the risk and COSHH assessments.

Always read the label on a bottle and the CoSHH assessments relevant to the contents before opening it and note whether the contents are caustic, inflammable or otherwise hazardous. Protective gloves must be worn when handling toxic chemicals.

Inflammable and volatile toxic substances should **ONLY** be used in a fume cupboard.

Safety glasses must be worn when carrying out any potentially hazardous operation with chemicals.

No substances must ever be mouth-pipetted.

For larger volumes, always use a bulb/teat attached to the pipette, or a plastic syringe with a rubber tubing adaptor. For small volumes, use an automatic pipette.

Certain compounds present specific hazards and have a printed warning on the manufacturer's label which should be recorded on the COSHH assessment. When handling certain chemicals, there is always some danger that noxious materials may be taken into the body. This may occur by three main routes:

INHALATION

INGESTION

SKIN ABSORPTION

Damage to the outer surfaces of the body may also occur if a chemical is corrosive. Clearly these processes are most likely to occur through an accident or by carelessness and, therefore, some guidelines need to be laid down in order to minimize the risks.

Again users must be familiar with the COSHH assessment and the COSHH forms for the chemical or procedure being used and the user must not carry out any procedure unless the user has been provided with recorded training from a competent person under the supervision of the PI, Supervisor or manager.

Toxic materials must be kept in the locked premises designated for their storage and only working amounts necessary for the work concerned should be removed. After use they must be locked away at once. Toxic waste must be disposed of using the procedures described in [Section 3.4\(e\)](#).

Poisons. Substances included in Schedule 1 of the Poison Rules under Section 7 of the Poison Act 1972 are marked S1. These substances are locked away in laboratories that use them. Users are responsible for signing these out and ensuring they are returned and secured properly following use.

Care should be taken in handling all chemicals but the following should be **particularly** noted:

Hydrofluoric acid - it can be used as a catalyst in organic chemical reactions, in the etching of glass and ceramics and for dissolving silica based rocks. It is extremely dangerous and must be handled using proper facilities, by properly trained, adequately protected responsible personnel. See the Schools Health and safety co-ordinator or deputies before use. It is essential particular working practices are in place these must be established in consultation with the above.

Phenol - this causes burns and should be handled preferably with gloves in a fume cupboard. If in contact with the skin, wash with copious amounts of water and then swab area for 10 minutes with glycerol.

Pyridine - should only be used if no alternative is available. It is highly flammable, producing a harmful vapour that irritates the eyes, skin and respiratory system.

Sodium azide - should not be put down any sink or drain. See School Health & Safety Co-ordinator before use.

b. Acquisition of controlled substances

See the Colleges [Policy for the Acquisition of Controlled Substances](#) for a full list of controlled substances and the procedure for purchase/acquisition.

Certain specified substances are subject to the requirements of legislation restricting their application as a result of their potential for use in illicit activities. For this reason strict obligations are placed on the College according to which substance is being acquired and may include, prior to acquisition:

- Possession of a licence or customer declaration;
- Requirement for improved security measures in the location where the substance will be used/stored;
- The necessity to hold/use amounts within specified limits under a permit;
- The obligation to declare certain activities to the national authorities prior to use.

Failure to adhere to the above requirements will mean that the College will be denied use of a substance or substances and may face criminal prosecution.

'Controlled' substances must not be brought onto College premises without prior notification to the College Director of Health and Safety, including those held by collaborating workers or other institutions. The ordering or procurement of substances which bypass this notification system is a breach of the duty placed on the College and may lead to action under the College's disciplinary procedure.

'Controlled' substances include:

- 1) Specified pathogens and toxins under Part 7 of the Anti-Terrorism Crime and Security Act 2001
- 2) Scheduled substances which can be used as 'Precursor Chemicals' in the manufacture of illicit drugs under Article 3 of EU Council Regulation (EC) 273/2004
- 3) Declarable activities for Schedule 2 and 3 substances under Section 22(1) of the Chemical Weapons Act 1996
- 4) Radioactive substances under Schedule 23 of the Environmental Permitting Regulations 2010.

Prohibited substances

The carcinogenic compounds 2-naphthylamine, benzidine, 4-aminodiphenyl and 4-nitrodiphenyl and their salts are prohibited. The compounds 1-naphthylamine, orthotoluidine, dianisidine, ichlorbenzidine and their salts may only be used under medical surveillance, and therefore cannot be used in undergraduate practical sessions.

ETHIDIUM BROMIDE MUST NOT BE USED IN UNDERGRADUATE PRACTICALS.

c. Chemical safety data

Each lab must have the following:

- A list of all the chemicals held
- A COSHH assessment on the correct form along
- A material safety data sheet for each of these chemicals;

These must be updated every 2 years, or when a procedure using that chemical changes. These can be held as hard copy or electronically, if held electronically a computer must be available to access the data in the laboratory.

d. Solvents

Storage of flammable solvents

Winchesters of flammable solvents MUST be stored in metal storage cabinets or ducted metal cupboards under the fume hood and not left on benches, the floor, or kept in fume cupboard workspace. In general a flammable organic solvent is one not containing halogens.

Bulk solvents MUST be stored in the flammable store see Robert Prouse or Steve Richards for space and access. Each person may only keep on the bench a working volume up to 500 cm³. All stocks above 500 cm³ must be stored in the laboratory solvent store

Flammable solvents should never be stored in a refrigerator, deep freeze or other electrically-operated enclosed space unless the apparatus is labelled **FLASHPROOF**.

e. Collection and disposal of waste

The individuals generating chemical, radioactive or biological waste have a duty of care to ensure that waste is disposed of thoughtfully and carefully. Laboratory workers must ensure that waste is minimised and that no other person is put at risk by the waste itself or during its disposal

Before disposing of waste, ensure that you are familiar with the following School procedures

Chem 4 Procedure for the safe Disposal of Chemical Waste

Chem 3 Safe handling and disposal of liquids and gels contaminated with ethidium bromide

CSP1 Procedures for the safe storage and collection of waste for autoclaving

CSP2 Procedure for the disposal by autoclaving of Arabidopsis plants and seeds in compost from CT rooms

Waste P1 Disposal of animal waste from laboratories

Waste P2 Disposal of GMO waste or plant waste containing micro-organisms from the Green houses CT rooms and laboratories

Waste P3 Disposal of GM0 waste from BSU greenhouses.

Waste solvents and aqueous solutions of toxic waste

It is illegal to pour organic solvents down the sink. The vapour can be explosive or toxic creating a hazard around the sink and in the sewers. Waste organic solvents and all solutions of aqueous toxic waste should be collected in the labelled glass containers provided in each laboratory. Label containers with the substances within and an approximate concentration – **this is essential for the waste contractor to know what they are treating.**

ONLY a maximum of 2.5 litres of each aqueous waste per research group can be stored in the laboratory. The waste must then be taken to the Stores on Level 1 according to the procedures in:

Chem P4. Procedure for the safe Disposal of Chemical Waste and
Chem P3 Safe handling and disposal of liquids and gels contaminated with ethidium bromide.
For further information, see the School Health & Safety Co-ordinator or the stores technician.

Waste solids and sharps

Waste solids must be collected in labelled containers or bags and taken to the Stores for disposal.

See Chem P4. Procedure for the safe Disposal of Chemical Waste, Chem P3 Safe handling and disposal of liquids and gels contaminated with ethidium bromide

Sharps bins are available from the stores and must only be filled to the fill line before disposal via the stores.

See Chem P4 Procedure for the safe Disposal of Chemical Waste.

Waste cultures of organisms

Before disposal, any biologically-infected material must be sterilised or disinfected.

See C P1 Procedures for the safe storage and collection of waste for autoclaving.

See [Section 2.7 for guidance on approved methods of disinfection.](#)

Autoclaving of organisms

Organisms should be sterilised by autoclaving for at least 45 minutes at 121oC.

See SCS1 procedures for safe collection sterilisation and disposal of waste by autoclaving by central services.

Incineration of material containing organisms

Soil contaminated with fungi, bacteria or other pests

See Waste P2 procedures for the disposal of GMO plant waste or plant waste containing micro-organisms from the greenhouse, CT rooms and laboratories.

Greenhouse plant growth room and compost waste.

See Waste P2 procedures for the disposal of GMO plant waste or plant waste containing micro-organisms from the greenhouse, CT rooms and laboratories.

CSP2. Procedure for the disposal by autoclaving of arabidopsis plants and seeds in compost from CT rooms.

Animal waste from laboratories

See Waste P1 Procedure for the disposal of all animal waste from laboratories

Broken glass

Special containers are available from the Stores for the disposal of non-contaminated glassware. Contaminated glass must be autoclaved or disinfected before is disposed of in the glass disposal bins.

Sharps and glass must **NOT** be placed in ordinary rubbish bins.

For further information see the School's Health & Safety Co-ordinator.

POTENTIAL HAZARDOUS ACTIVITIES AND PRECAUTIONARY MEASURES

You must report any accidents or incidents (near misses) to a member of technical staff and complete an accident/incident form. If you are unsure ask the Health and Safety Coordinator for advice.

f. Protection against injury by skin absorption/direct injury to body surfaces:

Precautions: When using a hazardous substance, all steps must be taken to prevent exposure. The CoSHH assessment **MUST** be read before any work is carried out. Volatile formulations must only be used in a fume hood, and appropriate PPE as identified in the COSHH assessment must be worn where use leading to spillage and droplet formation could result in skin contact.

The standard **disposable laboratory gloves** are blue nitrile, and purple ones should be used only when handling or using ethidium bromide. Information regarding limitations of their use, and suitable alternatives are available from the School Health & Safety Co-ordinator.

Safety spectacles must be worn if the risk assessment requires them and in laboratories which have been designated as requiring them to be worn. **Protective clothing** should be put on when entering the laboratory and taken off on leaving (see below).

Always wash your hands before leaving the laboratory or before touching your face or going to the toilet.

Wash with a suitable neutralising fluid and disinfectant all apparatus, instruments and bench surfaces that have been in contact with a potentially dangerous agent.

Accident response:

Always wash any area of skin which may have been in contact with the noxious agent. Use copious quantities of tap-water, with disinfectant and soap appropriate.

Wash with a suitable neutralising fluid and disinfectant all apparatus, instruments and bench surfaces that have been in contact with a potentially dangerous agent.

If any clothing becomes contaminated with a dangerous substance, then the clothing must be removed, or washed immediately *in situ*, as appropriate. Slight embarrassment is better than a permanent wound. How the clothing is further dealt with depends on the COSHH assessment for spillages and disposal.

You should make sure that you do not cut yourself with contaminated material, or broken or sharp equipment. If you are injured, then immediately seek **first aid (see [Section 2.5](#))**. It may be useful to keep a sample of the contaminant for the first aider ambulance personnel or the hospital doctors. (Always use cold clean water, particularly to irrigate any skin wounds).

g. Attaching pipette fillers to glass pipettes

One of the most common accidents in the laboratory is severe cuts to the hands resulting from a glass pipette snapping while attaching the pipette filler. The cuts are caused by the jagged ends of the pipette, and usually require stitches. This accident can be avoided by holding the pipette very

close to the end to which the filler is to be attached, so that any sideways force on the pipette is negligible while it is being pushed into the pipette filler. Wrapping both pipette and filler in a towel can also reduce the risk of serious injury.

h. Disease agents from animal sources

All members of the School working with soil or in the field should be protected against tetanus (lock jaw). This is a disease with a high mortality rate, caused by a species of bacterium commonly found in the soil and faeces. A suitable immunisation programme is offered by the College Health Centre for students registered with the College Doctor and can be sought from a GP for staff members. Persons working with wild mammals should also be immunised against tuberculosis and attend regularly for chest X-rays. This can also be arranged through the Health Centre. Wild vertebrates carry other pathogens, e.g. *Salmonella* and *Leptospira*, which are transmissible to man. The only way to protect against them is by adequate hygiene measures. Speak to the Health and Safety Coordinator if you believe you may require health surveillance for your work.

i. [Leptospirosis \(Weil's Disease\).](#)

Medical Information

Researchers working on riverbanks, in and around soils or other water sources are at risk of exposure to *Leptospira*, the causative agent of leptospirosis. None of the symptoms of early leptospirosis or Weil's disease are specifically indicative of this disease and diagnosis is based on laboratory investigations. The infection may resemble influenza in the early stages. Should you suspect you may have been infected, please see your doctor immediately.

The following precautions should be taken by persons working in contact with rivers or other water sources:

- Read the School's information sheet on Weil's Disease.
- As infection may enter through breaks in the skin, ensure that any cut, scratch or abrasion is thoroughly cleansed and covered with a waterproof plaster.
- Avoid rubbing your eyes, nose or mouth during work.
- Clean protective clothing, footwear and equipment, etc. after use.
- After work and particularly before taking food or drink, wash hands thoroughly.
- Report all accidents and/or injuries however slight.
- Carry your symptoms and instruction card with you at all times.

j. [Lyme Disease](#)

Medical Information

Lyme disease is caused by the bite of ticks infected with the bacteria *Borrelia burgdorferi*. Man and other animals can be infected with the organism but not everyone develops symptoms. **Not all ticks carry Lyme disease and ticks are not abundant everywhere.** Many infected people have no symptoms at all. Very common is a characteristic "bull's eye" rash which spreads out from the site of the bite after three to thirty days, accompanied by symptoms such as fever, malaise, fatigue, muscle aches and joint aches.

If you experience any symptoms such as this consult your doctor immediately.

Points to remember:

Before you start work in the field check if the area is known to have history of ticks and Lyme disease.

Read the School's information sheet on Lyme disease.

Ticks live in areas where there is long grass and access to host animals.

Ticks are usually active and seek feeds in the spring, summer and early autumn.

Not every tick is infected with the Lyme disease bacterium.

Wear long sleeved shirts and trousers tucked into socks or boots.

Inspect for ticks regularly in the field and when you return home.

Remove ticks as soon as possible.

See your doctor if you develop any of the symptoms and let them know if you have been exposed to ticks.

Carry your symptoms and instruction card with you at all times.

k. Laboratory animal allergy

The risk

All staff working with laboratory animals are at risk of developing a condition termed laboratory animal allergy (LAA). The condition is caused by exposure to airborne particles which carry the allergens generated by these animals. Sensitisation to LAA may occur over a protracted period of time as a result of continued exposure to these particles. LAA may arise through contact not just with mammals but also with invertebrates such as locusts and *Ascaris*. The symptoms in sensitised individuals are respiratory distress similar to asthma which occurs rapidly following contact with the allergens. Operations which generate high levels of air-borne dust particles carrying these allergens, e.g. cleaning dirty cages, sweeping the floors of animal rooms, carry the greatest risk. However, some risk is attached to all procedures involving laboratory animals.

To limit the potential risks from exposure to laboratory animal allergens, all staff working with laboratory animals will be required to follow the Protocol for Access & Health Surveillance, see below:

Biological Services Unit

Protocol for Access and Health Surveillance

New users (including newly appointed personnel and existing personnel)

1) All new users who need to undertake work in the Biological Services Unit must request in writing a 'Medical Permit to Work' from the Head of School, following which the Technical Operations Manager will ensure that the following questionnaire is provided,

General Pre-employment/New User Health Questionnaire

Which must be completed in full by the proposed new user and forwarded to the Medical Centre Administrator at the following address: rhul@ohworks.co.uk or posted to OHWorks, Bilting Business Centre, Canterbury Road, Ashford, Kent TN25 4HF.

It is mandatory for all new users to complete the above questionnaire. Failure to do so will delay the issue of a 'Medical Permit to Work' and means that, until such a permit is issued, entry to the unit is prohibited.

2) Upon receipt of the completed questionnaire the Medical Centre Administrator will ensure that an appointment is arranged for the proposed new user to meet with the Occupational Health Doctor

or Occupational Nurse. This appointment will be confirmed in writing to the individual, including the provision of general information and instruction on the spirometry (lung function) testing to be conducted as part of the appointment.

It is mandatory for all new users to attend the above appointment. Failure to do so will mean entry to the unit is prohibited.

3) During the above appointment the Occupational Health Doctor will review both completed questionnaires and undertake any further clinical assessment (including spirometry). He/she will complete all relevant sections of the questionnaire, including any follow-up action identified to be necessary.

Note: Spirometry tests may be undertaken on behalf of the Doctor by an Occupational Health Nurse. In such cases, the results section of the form will be completed by the nurse, and then reviewed by the Occupational Health Doctor.

4) Where it is identified that it is acceptable for the individual to work within the unit the Occupational Health Doctor will issue the 'Medical Permit to Work' passing the user as fit to work in the unit and, where required, identifying any work restrictions imposed.

5) The 'Medical Permit to Work' will then be forwarded to the Senior BSU Technician at the following address:

School of Biological Sciences
Royal Holloway, University of London
Egham Hill
Egham
Surrey TW20 0EX

The Head of School via the Senior BSU Technician will then ensure that the user is issued with a Security Card for access to the unit. This card will be activated for a maximum period of 1 year to new users. This card will only be issued after the completion of Induction and/Training. See Standard Operating Procedures for Secure and Restricted access to the BSU.

All new users will also be required to undertake a 6 and 12 week health status review, which will include, in both cases, the completion of a symptom questionnaire, followed by a clinical assessment (including spirometry) by the Occupational Health Doctor. The Medical Centre Administrator will ensure that the appropriate questionnaire is issued to the user at least two weeks prior to the projected health status review date. Users must then ensure that the questionnaire is completed in full and sent to the Medical Centre Administrator (see earlier address), or taken to their appointment and handed to the Occupational Health Nurse.

At a suitable time prior to the end of the above 1 year period the user will also be required to attend an annual health status review with, and arranged by, the Medical Centre Administrator, with annual re-assessment, thereafter.

It is mandatory for all users to attend the above identified health status reviews. Failure to do so will mean entry to the unit is prohibited.

Existing Users

All existing users of the Biological Services Unit will be required to have annual re-assessments with, and arranged by the unit technical staff and the Occupational Health Doctor, who will require the submission of a completed annual symptom questionnaire at least two weeks prior to the re-assessment.

It is mandatory for all existing users to attend an annual re-assessment. Failure to do so will mean entry to the unit is prohibited.

Respiratory Symptoms Procedure

In the event that the Occupational Health Physician identifies, from the health- screening questionnaire and spirometry results, that an individual may be at risk of having contracted occupational asthma, a 'Medical Permit to Work' will not be issued. Further medical investigation will be required to assist with the diagnosis of occupational asthma and the member of staff will be required to undertake serial peak expiratory flow readings.

The Occupational Health Physician will supply, train and supervise the employee in use of the peak flow meter (being required to record the best of three readings, at least four times a day for three weeks). Where it is then identified to be necessary, the employee will be referred to a Consultant Respiratory Physician with expertise in occupational asthma (currently at the Brompton Hospital).

In the event that a diagnosis of occupational asthma is made, the Health & Safety Advisor will report this to the Health and Safety Executive under the RIDDOR reporting arrangements.

Where the member of staff is diagnosed as suffering from asthma that is occupation-related, he/she may move to an area with complete and permanent avoidance of the allergen provoking the asthma. Alternatively, he/she may move to an area that in the opinion of the Occupational Health Physician involves significantly less but acceptable exposure, while remaining under medical surveillance at intervals appropriate to the nature of the work. Where it is established that the employee may work in the Unit, he/she will be issued with a 'Medical Permit to Work', with any identified restrictions, while being subject to regular health surveillance by the Occupational Health Physician at intervals appropriate to the nature of the work. Health care management of the employee will involve the use of medication for asthma; supervision of their medication may also be required by their GP in a Primary Care asthma clinic, following liaison between the Occupational Health Physician and the employee's GP.

Health Records

All medically confidential documents will be stored securely and maintained by the Medical Centre. Health records which are not medically confidential documents, but are a statutory requirement will be maintained and kept for at least 40 years from the date of last entry, in the Biological Services Unit.

I. Chemical or organic allergies

Allergies may also arise when there is repeated exposure to a variety of chemicals or material of organic origin, including plants fungi and pollen. You will probably not show allergic symptoms at the first exposure unless it is very prolonged, but you should take suitable precautions if you are likely to

be exposed to the irritant repeatedly and/or over a long period. If asthmatic symptoms, and/or an increased flow of secretions in the nose and to the eyes and/or rash appear when (or immediately after) handling chemicals, plant material or other materials of organic nature, please report this to the School Health & Safety Co-ordinator. They will then arrange a referral appointment with the Occupational Health Doctor if you or your family have a history of allergies please be especially aware of the increased likelihood of this.

m. Use of microorganisms

Inoculations with microorganisms should be carried out in the class II microbiological safety cabinets provided, following standard aseptic techniques. After use, cultures must be destroyed by autoclaving or the addition of biocides. See page 17 for the schools approved list of disinfectants. All spills must be immediately removed with the disinfectants provided.

See Spill1 School's emergency procedures for the spillages of microorganisms.

Spent cultures on Petri dishes should be placed in autoclave bags and stored safely before sterilisation and disposal. Contaminated pipettes and tips should be double bagged and stored safely before sterilisation and disposal.

See CS1 School's procedures for the safe storage and collection of waste for autoclaving.

n. Compressed gases

All gas cylinders must be contained in a stand or be secured upright by a chain, used in compliance with the BGAA code of practice and guidance notices.

Pressure regulators: a pressure regulator is attached to the cylinder to control the flow of the gas from the cylinder. A visual check of the regulator should be made every time it is attached to a new cylinder.

An 18 point check of the regulator should be carried out annually. The regulator will have an expiry date stamped on it by the manufacturer (normally 5 years), after this the regulator should be replaced.

o. Electrical hazards

College policy is that all portable electrical equipment is checked on an annual basis.

See the College [Policy and Procedure on the Maintenance of Portable Electrical Equipment](#).

The use of bimetallic strip energy controllers is strongly discouraged because of the risk of (a) the make-and-break spark causing an explosion in a flammable atmosphere, and (b) the controller sticking in a permanently 'on' position. The School recommends the use of thyristor or triac energy controllers.

If any equipment is found to be faulty please bring this to the attention of the Technical Operation Manager or Deputy.

- When using any electrical apparatus always make sure you know how to turn it off in an emergency. The switch should be positioned for easy access and so that it can be reached without stretching across the apparatus.

- Make sure that equipment is suitably earthed, that the correct fuses are inserted, and that there are no cables worn or damaged with bare wires showing.
- Never stand electrical apparatus in a position where it may be accidentally soaked with water or chemicals. Be careful when using electrical gadgets in a damp situation.
- Never use apparatus for a purpose or in a manner for which it is not designed.
- If you are in doubt about the use or safety of electrical (or other) equipment, please ask the School Health & Safety Co-ordinator who will arrange for it to be checked, etc.
- All electrical equipment that is left on out of hours should be labelled with the appropriate yellow card showing any special hazards which might arise from it, the name of the main operator and instructions for emergency action in case of malfunction. Do not carry out repairs yourself, but report anything wrong to the Schools Technical Operations Manager or their deputy.

p. Workshops

No tools or machines may be used in the workshops without the permission of the School Health & Safety Co-ordinator or the technician in charge of the workshop.

Permission will only be given if workshop staff are confident that the proposed operator is competent to handle the tools and machines safely. No tools may be removed or loaned from the workshop.

q. Danger from naked flames

Flames from Bunsen burners, spirit lamps, matches, etc., are a potential source of danger in the laboratory.

The flame may not always be visible and may cause burns if care is not exercised. Turn off any burner when not in use. Never stand a burner towards the front of the bench. Try to adjust the burner so that the flame has a yellow tip.

Naked flames should not be used when flammable solvents (see below) are in use in the laboratory. If you wish to heat a flammable solvent, use an electric hot plate or an electrically-heated water bath in a fume cupboard.

In case there is a fire. You should know the location of the nearest fire alarm call button and your escape routes. This will have been shown to you in your Health and Safety Induction training when you first arrived. See the Schools Health and Safety Co-ordinator if you have not had a your Health and Safety Induction training (see also [‘Emergency and Fire Procedures’, page 12](#))

If you are a trained Fire Marshal you should know the position of the nearest fire-extinguishers, and which type to use with different types of fire.

r. Autoclaves

The main hazards are

- Burns from physical contact with the autoclave or its load.
- Steam burns which can be extensive and serious.

- Explosive breakages of glass vessels during opening and unloading, due to temperature stress. These can lead to serious injury and burns.

Only the small boxer is available for use by research students or staff for the sterilisation of media, plastics and glassware. No undergraduate is allowed to use the Autoclaves.

Precautions for use:

Before using an autoclave you must have formal instruction in its use and your training recorded.

See section 3.8a. and CS P5 procedures for out of hours use of the small boxer autoclave

Loosen screw caps, load securely and do not balance objects in an insecure fashion. Do not overload. During use avoid contact with the wall of the autoclave and keep well clear of steam issuing from the autoclave.

After autoclaving, allow pressure to return to atmospheric pressure before opening the valve.

Automatic autoclaves will only open when at atmospheric pressure.

Open and unload carefully. When opening the lid avoid the residual steam. This can burn and may cause you to drop the hot contents. Insulated gloves will reduce the risk of burning hands. A laboratory coat should be worn to help protect the arms. When wearing insulated gloves remember that gripping is more difficult.

It is safer to wait a few minutes after opening the lid, to allow contents to cool slightly, before moving anything. Large vessels of liquid should be allowed to cool for a much longer time, and care should also be taken with glass bottles and flasks whose bottoms sometimes fracture, spilling their hot contents.

Leave the autoclave in a clean and usable condition for the next user.

Report any malfunction as soon as possible to the Technical Operations Manager, especially if it concerns the safety valves or pressure control operations.

Useful notes on autoclaving:

Do not autoclave phenolic disinfectants.

Do not allow mercury compounds to escape in aluminium autoclaves.

Do not autoclave cellulose nitrate centrifuge tubes: they explode.

Do not contaminated materials containing Ethidium bromide

s. Lasers

It must be remembered that beside the obvious dangers to the eyes and skin from laser radiation, other hazards exist.

All users must be aware of the particular hazards of the lasers they are working with to ensure their safety and the safety of others. See College [Safety Policy in relation to the Use of Lasers 2001](#).

All lasers except for low power Class 1 lasers must be registered with the Laser Safety Officer (through the School Health & Safety Co-ordinator).

Laser pointers are now widely used and it is important that a code of practice is followed to ensure they are used safely, see [College Laser Safety Rules – Laser pointers](#). These rules must be followed by anyone who use or acquires laser pointers or pens for use on campus.

3.6 GENETICALLY MODIFIED ORGANISMS (GMOS)

This code of practice constitutes a set of rules for those involved in genetic manipulation/ modification experiments within the School only, and should be read as an appendix to the School

Code of Safety. The School Biological Safety Officer (BSO) holds copies of a "Compendium of Guidance Notes from the HSE Advisory Committee on Genetic Modification" and these are available should you require more detailed information.

Training and supervision

It is the responsibility of individual Academic Staff supervising GMO work to ensure that this code of practice is followed.

All work involving GMOs must be preceded by completion of a statutory Risk Assessment and clearance by the **School Genetic Modification and Biological Safety Group (GMBSG)**. Consult the BSO if necessary. Work must be performed under appropriate containment conditions, and with appropriate HSE Notification.

Before any new entrant begins work in a containment laboratory they must be familiar with these local rules and the correct use of equipment.

Work of new entrants must be supervised by a responsible member of laboratory staff and an initial period of instruction in good microbiological practice, and in the disinfection and disposal of potentially hazardous materials is required.

No unauthorised persons may enter the containment area for cleaning, servicing/repair of equipment etc without previously notifying a responsible member of staff and disinfection, if necessary, of appropriate laboratory surfaces equipment.

The BSO has authority to halt or amend any procedures or experiments that do not conform to these rules.

Code of practice – containment laboratory areas (e.g. for SACGM Levels 1 and 2, ACDP Hazard Groups 1 & 2.)

Laboratory doors should be closed when work is in progress. Laboratory coats must be worn at all times. Eating, drinking, chewing, smoking, storage of food and applying cosmetics must not take place. Mouth pipetting must not take place. Coats and hand baggage should be kept outside of laboratory areas.

Effective disinfectants must be available for routine disinfection and immediate use in the event of spillage. Absorbent spill kits must be available to clear any large-scale spillage. Laboratory surfaces should be non-absorbent and wiped down with disinfectant at the end of each day.

In general work may be conducted on the open bench at containment level 1, but care should be taken to minimise aerosols. Manipulations such as ultrasonic disruption which produce high aerosol levels must be conducted in a microbiological class II safety cabinet depending upon the containment risk assessment. Containment level 2 work will almost certainly require the organisms to be manipulated in such a cabinet. There is a code of practice for working in rooms with such facilities.

Wearing of gloves is not necessary for standard microbiological procedures at containment level 1 but is advisable to avoid contamination of the sample. However, this depends on the individual risk assessment of reagents. When cuts or abrasions or other skin lesions are present, the use of gloves may be required. Hands must be washed thoroughly and immediately when contamination is suspected, after handling GMO materials, and also before leaving the laboratory suite. Hand washing facilities with wrist or elbow taps are recommended.

Used laboratory glassware and plastics awaiting sterilization, disinfection and disposal (or incineration) must be stored in a safe manner. Pipettes, if placed in disinfectant, must be > 80% immersed. All waste solids and liquids must be made safe by autoclaving or appropriate disinfection procedures prior to disposal. GMOs must not be transported in corridor/ non-laboratory areas except in leak-proof containers (see below).

Taking of medication: It is advisable that prior to treatment with drugs which affect immune competence, e.g. steroids, or other self-medicaments which may influence chances of infection by, for example, recombinant *E. coli* e.g. antacids, workers consult the BSO or the College Medical Officer through their supervisor.

Disinfection and disposal of contaminated materials

All waste materials should be clearly labelled with a description of general content, or labelled more specifically depending on the hazard level.

Contaminated materials include intact or fractionated GMOs, liquid or semi-solid (agar/agarose) cultures of GMOs and their residues (*E. coli*, yeast, viral particles, eukaryotic cells), all glass and plastic ware and liquid reagents which have come in contact with these materials (including gloves, vacuum traps etc).

Check the Microbiological efficacy of the disinfectant for your organism before you use any of the disinfectants

[See Section 2.7 on Approved Methods of Disinfection](#)

Liquid materials should be mixed at the appropriate concentration of disinfectant and stored for at least 2h before disposal in sinks.

It is important that there is sufficient contact time between disinfectant and sample for the item to be made safe. The disinfectant must also be active. Some disinfectants, such as Virkon and Chlorox, have a very short period of activity when in solution form. Vessels with such disinfectant must be date/time stamped and then disposed quickly after disinfection is complete.

Solid or semi-solid materials for disposal or recycling i.e.: plastics, agar/agarose plates, disposable pipettes, glassware etc. should be treated with dilute disinfectant or autoclaved followed by normal disposal/ wash-up procedures. Leak-proof containers must be used to transport materials from the laboratories to the autoclaving facilities.

See CS1 Procedures for the safe storage and collection of waste for autoclaving.

Autoclaving of clearly-labelled bagged waste must be performed with an attached internal thermolog tag, and must be retreated until an adequate reading occurs. The content and thermolog outcome of each run must be recorded in the autoclave log afterwards prior to release into the domestic waste disposal system.

See CSS1 School's procedures for safe collection, sterilization and disposal of waste by autoclaving by central services.

All greenhouse, plant growth room waste, plant and compost must be placed in clinical 5 kg waste bags for disposal by incineration by an outside contractor.

See Waste P2 Procedure for the disposal of GMO plant waste or plant waste containing micro-organisms from the greenhouse CT rooms and laboratories.
CSP2 Procedure for the disposal by autoclaving of Arabidopsis plants and seeds in compost.

Emergency spillage procedures

See *Spill 1 The School's emergency procedures for the spillage of microorganisms.*

- Small volume (less than 100ml) spills of micro-organisms should be covered immediately with paper towel to prevent the generation of aerosols. Then pour on the disinfectant and leave to stand for 15 minutes. Disinfectants that may be used are listed below but Distel (formerly called TriGENE) should be the first choice. Place the paper towel in autoclave bags for inactivation by autoclaving. .
- Large volume spills (greater than 100ml) of micro-organisms should be immediately absorbed by paper towel a granular material such as 3M disposable Spill Kit. Care should be taken not to create aerosols by violently disturbing the spill. When all the liquid has been absorbed, carefully place all contaminated materials in an autoclave bag to be inactivated by autoclaving.
- The contaminated surface can then be disinfected with one of the agents listed below but Distel (formerly called TriGENE) should be the first choice. The contaminated paper towel is then added to the autoclave bag to be inactivated by autoclaving.
- In case of a major accidental spillage (>500ml) of any class 2 GM or hazard group 2 biological agents all workers in the vicinity must be notified and the hazardous area must be cleared immediately. Contaminated clothing should be removed taking care not to spread the contamination further. The contaminated clothes should be placed in an autoclave bag and sent to be autoclaved. Follow the procedure for large volume spills as above.

An incident report must be completed and sent to the Schools Biological Safety Officer in the event of a major spillage

If a spill occurs inside a safety cabinet, the cabinet should not be switched off until the decontamination has been completed. This must include decontamination of the spill tray beneath the work table. **In the case of organisms categorised at Level 2 and above** the cabinet should be fumigated before being re-used.

If the spill occurs in a centrifuge:

See **Spill P3**. Procedure for breakages or suspected breakages and spillage of micro-organisms in a centrifuge

If the spill occurs in a shaker:

See **Spill P2**. Procedures for breakages or suspected breakages and spillage of micro-organisms in a shaker.

An incident report must be completed and sent to the School's Biological Safety Officer.

3.7 ACCIDENT/INCIDENT INVESTIGATION AND REPORTING PROCEDURE INCLUDING OCCURRENCES REPORTABLE TO THE HEALTH AND SAFETY EXECUTIVE UNDER THE REPORTING OF INJURIES, DISEASES AND DANGEROUS OCCURRENCES REGULATIONS 2013

This procedure applies when an accident, incident, or case of disease, occurs to an employee of Royal Holloway, University of London and in the event of a 'dangerous occurrence' taking place. Its requirements extend to students and visitors to College premises, and include contract staff either self-employed, or employed directly by a company carrying out work on behalf of the College.

It is essential that a College Accident/Incident Report Form is completed for all accidents and incidents, irrespective of whether injury results or notification is required to be made to the Health and Safety Executive.

Those specific 'accidents', 'cases of disease, or 'dangerous occurrences' that are reportable to the Health and Safety Executive under the 'RIDDOR' Regulations 1995.

Definitions:

Accident – an event resulting in injury or death

Incident – an event that had the potential to result in harm (of a minor, serious or fatal nature), although no injury actually took place – these may also be referred to as a near miss.

Major Injury -

Cases of disease – there is a duty to report cases of certain diagnosed reportable diseases which are linked with occupational exposure to specified hazards these are listed below.

- Carpal Tunnel Syndrome
- Cramp of the hand or forearm
- Occupational dermatitis
- Hand Arm Vibration Syndrome
- Occupational asthma
- Tendonitis or tenosynovitis

Dangerous Occurrences – these include but are not limited to incidents involving, lifting equipment, pressure systems, electrical incidents causing explosion or fire, explosions, biological agents, radiation generators and radiography, breathing apparatus, diving operations, collapse of scaffolding, wells and pipelines.

See the College's [Accident/incident Investigation and reporting procedure](#).

In the event of an accident/incident involving a member of staff, student students and visitors to College premises, and include contract staff either self-employed, or employed directly by a company carrying out work on behalf of the College, it is the responsibility of the Head of Department/School/Director of the area in which the accident occurred, to ensure the following action is taken:

The person having the accident/incident shall complete an Accident/Incident Report form, wherever possible, immediately after the occurrence but where that may not be possible, within a period not exceeding 48 hours. In the event of their being unable to do so, completion should be by their Head of Department/School/Director (or member of staff acting on their behalf). Where applicable, Witness Report Form(s) shall also be completed. Any accident/incident involving a member of staff or student occurring outside of College premises, where the person involved was engaged in activities directly related to their duties or studies must also be so recorded.

3.8 PERMIT TO WORK SYSTEM

(a) For College maintenance staff.

When the Technical Operations Manager or deputy completes a 'Request for Repairs' on the portal to carry out work, in an area with potential hazards a contact name is give for that area and the DLT must report to that person before any work can be carried out in that area. This constitutes a permit to work.

(b) For outside contractors and service engineers

See separate regulations obtainable from the School Health & Safety Co-ordinator or his/her Deputy.

3.9 LONE WORKING

See the College's Lone working Policy and Procedure

See LW1 SBS lone working policy and procedure

Normal working hours in the School are:

Staff and postgraduate students in Research Laboratories Monday-Friday 08.00 -19.00

Undergraduates Monday –Friday 09.00 - 17.00

Definition

Lone working refers to all work proposed to be undertaken alone, where the risk to the lone worker may be increased either by the work itself, or by the lack of on-hand support should an incident occur.

The School defines lone working as working alone in a single laboratory or room.

Lone working can occur:

- During normal working hours at an isolated location within the normal workplace.
- When working outside of normal working hours.

All work undertaken at weekends, during public holidays and when the College is closed (i.e. discretionary days) is considered to be outside of normal hours.

Under any of these circumstances, the School's Lone and Out-of-hours working policy and procedure will apply.

No **regular** lone working is to be carried out in any research laboratory outside of these normal hours unless adequate control measures have been identified through the risk assessment process and agreed with the Head of School.

NO LONE WORKING IS TO BE CARRIED OUT BY UNDERGRADUATES OUTSIDE THEIR NORMAL WORKING HOURS.

Risk assessment and control

PIs, supervisors, and managers in the School must ensure that all lone working activities are formally identified and appropriate risk assessments undertaken. These assessments must identify the risk to lone workers and the control measures necessary to minimise risks, as far as reasonably practicable. The Head of School and the Health and Safety Coordinator have identified the following activities as being in the categories shown when conducted in **isolation**.

LOW RISK	<p>working in an office</p> <p>working in a greenhouse during normal working hours</p> <p>working in growth rooms or CT rooms during normal working hours</p> <p>working in the BSU or aquaria during normal working hours</p> <p>Working in microscope rooms during normal working hours</p> <p>See Risk assessments and procedures on the T drive to be adapted for your use</p>
MEDIUM RISK	<p>Out-of-hours maintenance of greenhouses, growth rooms, CT rooms, aquaria and the BSU</p> <p>Non-hazardous laboratory work carried out by trained, competent staff</p> <p>Procedural work in the BSU</p> <p>Any work-related activities undertaken by staff with severe allergies</p> <p>See Risk assessments and procedures on the T drive to be adapted for your use.</p>
HIGH RISK	<p>Working with quantities of liquid nitrogen over 500ml</p> <p>Working with Chemicals with Hazard Statements H200-205; EUH001-044 (explosive), H220-228; EUH209/209A (flammable or becomes flammable in use), EUH 019 (explosive Peroxide) H300,301,304, 310 311,331, (toxic and/or fatal), H314 (burns), H340-373-45 (serious irreversible effects, sensitisation, cancer)</p> <p>Working with radioactivity</p> <p>Working in the dark room</p> <p style="text-align: center;">NO LONE WORK IN THIS CATEGORY IS PERMITTED</p> <p>...unless all the following measures are implemented and agreed by the Head of School.</p> <p>A risk assessment must be completed for each activity using the College's 'General' Risk Assessment form; guidance can be obtained from the College Lone Working Policy and Procedure, appendix 5.</p> <p>A copy of the risk assessment produced by the PI, supervisor or manager must then be forwarded to the Head of School for approval and countersigning (see Appendix 4 – Lone Working Approval form in the College's Lone Working Policy and Procedure) <u>at least one week before any work commences</u></p>

Information, Instruction and Training

PIs, supervisors or managers must ensure that everyone who is required to work alone at any time is competent to do so, having received suitable and sufficient information, instruction and training (including refresher training) to enable them to work safely. The extent of the instruction and training provided will vary according to the level of risk identified.

Records of training and refresher training must be retained by the PI, supervisor or manager, in the red folder.

It is the responsibility of all staff and students to undertake work (including lone working) in accordance with risk assessments, to comply with any information and training received, and to report immediately to their line manager any problems or concerns.

Supervision of lone working

Although lone workers are not subject to constant supervision, PIs and managers are still required to ensure appropriate control of the work. Supervision complements information, instruction and training, ensuring that staff and students understand the risks associated with their work, and that necessary safety precautions are being carried out. It can also provide guidance in situations of uncertainty.

The extent of the supervision required depends upon the risks involved and the proficiency and experience of the person carrying out the work. Persons new to a job, undergoing training, doing a job which presents special risks, or dealing with new situations may need continuous supervision until such time as they are competent to work alone.

The extent of the supervision is the PIs or manager's decision, to be made in conjunction with the Head of School, and the Health and Safety Coordinator, which should be established through the risk assessment process. It should not be left to individual members of staff or students to decide that they require assistance or supervision.

Activities away from College premises

Those on field work must follow the principles within this document, but may encounter risks that can be adequately managed by the guidance contained in the College's [Policy for and Procedure The Health and Safety of Students Working or Studying in the UK or Overseas](#).

3.10 TRAINING REQUIREMENTS AND COURSES

Use of autoclaves.

See CSP5. School's procedures for the out of hours use of the small Boxer autoclave.

No individual may use autoclaves without receiving approved training within the School. Only the small Boxer autoclave is available for research groups' use. Training will be given on all autoclaves by the Superintendent, Deputy Superintendent or staff of central services. A log of trained users will be held by central services staff.

Use of power packs. All new postgraduate students and inexperienced research staff must receive training in the use of electrical power supplies before they are permitted to begin work in the laboratory. This training will be given by Mr C Gerrish, at the start of the academic year, and at other times as required.

Use of high speed centrifuges.

See C'fugeP1. Procedure for the use of School ultracentrifuges.

All new postgraduate students and inexperienced research staff must receive training in the use of ultra centrifuges. Fiona Purse Steve Richards, Chris Gerrish, or an outside company will carry out this training. It is also recommended that the film principles and practices of Centrifugation should be watched.

Use of dark room

See *DRP1. Procedures for the safe use of the dark room.*

DR2. Procedures for the safe use of the UV Trans-illuminator

All new users of the automatic developer must attend training from Ray Smith before use. Training on the use and procedures used in the dark room must be carried out by their PI manager or supervisor before any new user can use the dark room.

Working at Heights

See [College working at height guidance documents and policy and procedure.](#)

PI manager or supervisor must ensure any one working at heights is competent to do so having received suitable and sufficient information, instruction and training while being trained, is supervised by a competent person.

Other training

Details of various safety training courses are available from through the College Health and Safety Office, the School Health & Safety Co-ordinator and on the College and Health and Safety Web site.

- Managing Safely
- First Aid at Work
- Fieldwork first aid
- General Risk Assessment
- Display Screen Equipment Assessor
- Manual Handling (Risk Assessment)
- Manual Handling (Practical Skills)
- Control of Substances Hazardous to health (COSHH Assessor)
- Fire Safety
- Fire Marshal
- Accident/Incident Investigation
- Anaphylaxis (Epipen) training
- Gas systems / Pressure systems
- Cryogen handling

3.11 USE AND CARE OF CENTRIFUGE AND ROTORS

See C'fugeP1 Procedure for the use of School ultracentrifuges.

See C'fuge P2 List of ultra centrifuges maintained by the school and available rotors.

PIs and Supervisors must put in place the procedures for the training, use and care or centrifuges and rotors if they are held in their laboratories

Laboratory Centrifuge: An apparatus used for separating substances of different density or particle size, when suspended in a fluid, by spinning them about an axis in a suitable container.

Rotor: Primary component of a centrifuge which holds the material to be subjected to centrifugal force (in some form of tube/container and which is rotated by the drive system).

Fiona Purse and Steve Richards have the responsibility for the care and general maintenance of the School ultracentrifuges and rotors.

Users have the duty to ensure that the machines and rotors are used safely and that the machine and rotors are left in a safe and clean condition for the next user.

Operation

Only registered and trained personnel can operate the School ultracentrifuges.

- See Fiona Purse, Steve Richards or Chris Gerrish.
It is recommended that the film Principles and Practices of Centrifugation should be watched.
- The machine log found in the folder in each centrifuge room must be completed.
- Check the user manual for specific requirements and load limitations and speed.
- Follow the operating procedures for each machine.
- Before using the rotor its lid and seals must be examined for cleanliness and damage. Damaged rotors or seals **MUST** not be used and should be reported to Fiona Purse or Steve Richards.
- Inspect all centrifuge tubes prior to use; **do not use** cracked, broken or damaged tubes. Never fill centrifuge tubes above the maximum recommended by the manufacturer.
- Check compatibility of tube material to solvent medium. Some solvents may cause the tubes to swell or crack in the rotor. Do not use chemicals that are explosive or highly flammable.
- Use only correctly fitting tubes.
- Make sure each tube compartment is clean and corrosion free.
- Make sure the rotor itself is clean, corrosion and crack-free and that there are no scratches or burrs around its rim
- Balance the rotor to within the limits specified (materials of similar weight are in opposite positions of the rotor).
- Always add centrifuge tubes to all buckets whether fixed and swing out.
- **Never exceed the maximum stated speed for any rotor.**
- Check that the centrifuge chamber, drive spindle and tapered mounting surface of the rotor are clean and free of scratches or burrs.
- Ensure that the rotor pins are 180 degrees to the spindle pin.
- Make sure that any rotor lid securing device and any rotor-to-spindle securing device is fully secured before starting the machine. Give a small tug on the rotor to ensure that it is secure.
- Do not operate the centrifuge without the appropriate rotor cover securely fitted and with its seals in place.
- **Stay with machine until the selected rpm is achieved by centrifuge.**
- Only authorized and suitably trained persons may service or repair a centrifuge. Report all faults promptly, to Steve Richards or Fiona Purse; do not attempt repairs yourself.
- Do not use the centrifuge until the reported faults are repaired.

Rotor Care

Stress corrosion is thought to be initiated by certain combinations of stress and chemical reaction. If the rotor is not kept clean and chemicals remain on the rotor, corrosion will result. Also, any moisture left for an extended time can initiate corrosion. It is important that the rotor is left clean and dry. (Wash with mild detergent and warm water.) Dry the rotor thoroughly and store upside down in the fridge with the cover and tubes removed.

Emergency Procedures

If the centrifuge malfunctions while in operation turn off the machine and get assistance from one of the following Chris Gerrish, Steve Richards or Fiona Purse.

If a spillage occurs within the machine during use follow the instructions as in the

See Spill 3 *School's procedures for breakages or suspected breakages and spillages of micro-organisms in a centrifuge.*

3.12 RADIATION

(a) Radioactivity

The Departmental Radiation Protection Supervisor must be consulted before any person can bring any radioactive sources into the School or working with any radioactive items.

Any member of staff or postgraduate planning to undertake radioactive work must first contact the Departmental Radiation Protection Supervisor. Separate instructions on emergency procedures relating to excessive exposure to radiation are attached.

Laboratory coats and suitable PPE MUST be worn when working in the radiochemical laboratories at all times. These coats must be monitored before leaving the laboratory. Please monitor all areas described on the laboratory log sheet making a note of any contamination and logging the level. Lastly wash your hands before leaving the radiochemical laboratory area.

Anyone proposing to work with radio-isotopes must register and have attended a suitable course or training, to satisfy the College Radiation Protection Officer of his/her competence to practice the techniques proposed, before they start the work.

Those using radioactive compounds in the School must familiarize themselves with the contents of the *Local rules for work with ionising radiation*, and the College document *Rules Governing Work with Radioactive Substances and Disposal of Radioactive Waste to conform with the Radioactive Substances Act 1993* available from the School's Radiation Protection Supervisor. Other useful publications include:

Code of practice for the protection of persons exposed to ionising radiations in teaching and research. Published by the Department of Employment, HMSO.

Radiological protection in Universities. Published by the Committee of Vice-Chancellors and Principals.

Notes for the Guidance of Personnel Handling Radioactive Isotopes.

Emergency procedures relating to excessive exposure to ionizing radiations or radioactive substances, radiation burns and radioactive contamination

In the event of an accident of this nature, the School Radiation Protection Supervisor and/or School Health & Safety Co-ordinator should be informed immediately. Specialist treatment of cases of radioactive contamination, radiation burns and excessive exposure to ionising radiation is available at The Royal Marsden Hospital, Fulham Road, London SW3. For assistance, telephone 0207-352-8171, asking for either the Radiological Protection Officer or, in his absence, the Physicist-in-Charge of the Medical Physics Department. The Royal Marsden, being a specialist cancer hospital, **may not be able to deal with severe physical injury.**

Such casualties should be directed to the nearest hospital equipped to deal with the injury but, if needed, the Royal Marsden will give advice and help on decontamination of personnel and the treatment of radiation burns. 49

Action to be taken in the event of accidents involving the spilling and/or spreading of radioactive substances

Minor spillages or leakages might be dealt with without outside help. Where necessary, seek the advice and assistance of:

- (i) the Supervisor of the work in progress
- and/or (ii) the School Radiation Protection Supervisor (ext 3895)
- and/or (iii) the College Radiation Protection Officer (ext 3828)

Major spillages or leakages may require help from outside the College. Such action would normally be taken after consulting the College Radiation Protection Officer. In an emergency, telephone the National Radiological Protection Board at Harwell (01235-821111, Ext 3144) and ask for advice and/or assistance.

Requirements of the Radioactive Substances Act

- (i) In the event of loss or suspected loss or theft of radioactive sources or material
 - (a) Take all reasonable practicable measures to trace source or material
 - (b) Notify immediately any loss or theft to the police and to the Radiation Inspector, Department of the Environment (see below).
- (ii) In the event of damage to a radioactive source or escape of radioactive material
 - (a) Take all reasonably practicable measures to prevent dispersal of any radioactive solids or liquids which have escaped.
 - (b) Notify immediately the Radiation Inspector, Department of the Environment through the School Radiation Supervisor or College Radiation Protection Officer.

(b) Ultra-violet radiation

Use of UV sources (e.g. for detecting fluorescence on chromatograms or for photochemical experiments or sterilisation of cabinets) will cause irritation of the eyes some hours after exposure. Face shields should be used, and the source should not be looked at. Only the minimum time should be spent near the source.

PIs or supervisors must ensure the training of users, and have procedures in place for the use of the equipment and the correct use and storage of the appropriate PPE.

See DRP2. School's procedures for the safe use of the UV trans-illuminator
PPE. School's personal protective equipment policy.

(c) Useful telephone numbers:

Medical Officer: Windsor
01753 865773

National Radiological Protection Board, Harwell
(for advice and practical assistance):

01235-821111, Ext 3144.

Royal Marsden Hospital
(Radioactive contamination and radiation burns)
0207-352-8171

Pollution Inspector - Environment Agency
01252 776600

Emergency Services
Fire, Police, Ambulance: (9) 999
College Security - emergency line (24 hours): 444

3.13 FIELD WORK AND EXTERNAL VISITS

Field work is defined as:

Work or study which is undertaken outside the normal work/study environment, including any undertaken away from College owned or leased property. It will also include work that is beyond normal daily activities on College premises (examples include biological surveys at Huntersdale, soil sampling at Alderhurst and social science surveys on the main College campus).

Field work may be categorized under three headings:

- a) Field trips - consisting of groups of students led by one or more staff members.*
- b) Student projects - consisting of individual student field work undertaken by a small number of students with no direct staff supervision, including undergraduate or post-graduate research work.*
- c) Research work - consisting of staff carrying out research work either on an individual or on a group basis.*

It may also be classified by the locality in which the field work takes place and be undertaken within or outside the UK, in urban or rural settings. Each of the above will have its own associated hazards and risks which must be identified and addressed in the risk assessment process.

The personnel identified below will take operational responsibility, ensuring that the required procedures are implemented, the risk assessment carried out and that information is disseminated in an appropriate form to all persons, i.e. staff, students or visitors, attending the field trip.

- a) For field trips, the member of academic staff responsible for organizing the field trip.
- b) For undergraduate student projects, the academic staff member identified as the student's supervisor for the project.
- c) For postgraduate projects, research and dissertations, the student may carry out the procedures in consultation with the member of academic staff who is the student's supervisor, although ultimate responsibility will lie with the supervisor of the student or the particular project. 51
- d) For staff research, the activity leader will be responsible for the staff or students carrying out work on behalf of their research.

In all cases a trained departmental field work risk assessors/health and safety coordinator must be consulted at an early stage in the planning. All field work shall be risk assessed using the standard College 'Field Work Risk Assessment Form'.

Personal Details

Each person attending a field trip will be asked to provide, in confidence, some basic personal information to a named senior member of staff in the School (and a copy held at the College by the Head of Security in the event that it should be needed in the event of an emergency situation arising from the trip). The information shall consist of:

Name, Term Time Address, Contact Number, Next of Kin, Address of Next of Kin, Next of Kin Contact Number.

Copies of this information may be collated at the start of each academic year, but will be checked and, if necessary, updated prior to each field trip. Heads of School shall keep such information in a secure location.

Contact Details

Prior to a trip, a set of contact details shall be prepared by the member of academic staff responsible for organizing the field trip and a copy will also held by the Head of Security. Details will consist of contact address, at least two contact phone numbers and, if possible an alternative means of contact. This is to allow the College the ability to contact or re-establish contact with the group in case of an emergency.

Lone working.

See LW1 . School's lone working policy and procedure.

College's lone working policy and procedure

Medical and Health Considerations

Each person undertaking field work will be asked to complete a confidential health questionnaire, including information that will only be divulged when it is:

- (a) Essential to the ability of those organizing the trip to comprehensively plan appropriate contingency arrangements in the event that medical assistance is required.
- (b) Relevant to first aid personnel in an emergency situation.
- (c) Vital information for medical staff.

A person may withhold any information but by so doing they accept that, if, in an emergency, inappropriate action is taken or appropriate action is not taken, as a result of missing information, it is entirely their own responsibility.

Where all reasonably practicable steps (both from health, safety and welfare, and equal opportunities viewpoints) have been taken, and a significant risk remains to the safety of the person and/or third parties, then that person should may not be permitted to take part in the relevant section of the field work. Participants must receive adequate instructions on the likely health hazards associated with the work.

First Aid

The numbers of qualified first aiders shall be determined from the risk assessment process. Issues to be taken into account include the location of the trip, the number of people within the group or sub-

groups, and the quality of communication. There should be a minimum of one qualified 4-day trained first-aider or field trip trained first aider with each group of students carrying out field work.

First Aid Boxes

Each qualified first-aider shall have access to a first aid kit at all times whilst in the field. On individual trips, it should be risk assessed whether it is practicable for untrained people to take a first aid kit. If they do so, they must be given a basic understanding of the kit and basic emergency first aid procedures to be followed.

Accidents and Emergency

The course leader is responsible for organizing emergency procedures and ensuring that all members of the group are aware of the arrangements.

All accidents and incidents should be reported as soon as possible, as laid down in the College's accident and incident reporting procedures.

Driving on Field Trips

Only persons who have completed Driver Declaration form to achieve approved driver status are allowed to drive the School vehicle. A list of persons with the approved driver status is held by the Technical Operations manager. All risks associated with driving the departmental vehicle must be assessed and the driver's competence to drive the vehicle must be established.

NO ONE is allowed to drive a mini bus unless they have been on the approved training.

See The Colleges Driving and Vehicle Safety Policy and Procedure.

During the course of the field trip, vehicles will be the responsibility of the authorized driver who will be required to undertake the specified safety checks immediately prior to and at intervals during the trip.

Environmental considerations/Wildlife & Countryside Act 1981 and Environmental Regulations etc.

Many types of fieldwork will take place in open country involving, for example, the study of flora, fauna, soils or geological conditions in that area. Under these circumstances, it is the duty of the fieldwork organiser to ensure that access to the site is legal. If the work takes place off public land then the permission of the landowner **must** be obtained. The permission of the landowner to enter the site does not free the fieldwork leader from responsibilities under the *Wildlife and Countryside Act (1981) and Environmental Regulations etc*, and leaders should be familiar with the Act and Regulations if their work is likely to have any impact, directly or indirectly, upon the flora and fauna. If the work takes place on a Site of Special Scientific Interest (SSSI) then the site owner should, in theory, seek permission from the appropriate authorities e.g. English Nature. In practice, it may be more expedient for the University to liaise with such authorities directly and to inform the landowner that this has been done. The authorities will be able to advise the fieldwork leader if the work is likely to contravene the law and to discuss the granting of a licence, if necessary. Local offices of these authorities will also be able to advise on the hazards associated with the area. For fieldwork overseas, supervisors are advised to establish a clear and written agreement on permitted work areas and work practices. This would often be with a host institution, but the country's embassy will advise.

Registration and Authorization

Once the planning and risk assessment procedure has been completed, then the Head of School may authorise the commencement of the work. All fieldwork should be supported by a base which has knowledge of:

- all work involved;
- itinerary and return times;
- members of the party and their details; and
- How they may be contacted.

Depending upon the nature of the work, the University may wish to authorise their staff and student workers by the issue of identity cards. For overseas work, in particular, it is prudent for the School's Senior Faculty Administrator and/or Head of School or College Security to retain passport and visa details, and names and addresses of next of kin.

Information available from Health and Safety Coordinator

- School's Health and Safety notes for field work for Undergraduate Students.
- School's information sheet on Lyme disease; [also see 3.4j](#)
- School's information sheet on Leptospirosis (Weil's disease); [also see 3.4 k](#)
- Mammals and the Law

3.14 NEW AND EXPECTANT MOTHERS

An expectant mother is required to advise her manager that she is pregnant. It is important that this is undertaken at the earliest opportunity in order that the arrangements identified in the '**College's Maternity and the Risk Assessment Process Health and Safety Guidance Document**' can be implemented as soon as possible for the protection of both the mother and child.

The College guidance has been developed to provide health and safety information to those who are pregnant, have given birth within the previous six months, or are breastfeeding. It also identifies the procedures that managers will follow to ensure that appropriate health and safety arrangements are implemented for the protection of the mother and child.

Before returning to work, the member of staff must notify her manager of her intention to do so at the earliest opportunity. Before re-commencing duties, the manager and member of staff will review any current medical advice, the risk assessments and identify any further action which may be required.

3.15 SAFETY AUDITS AND INSPECTIONS

Safety inspections will be made on a bi-weekly basis to a selected area by the Head of School, the School Health & Safety Co-ordinator and at least one other member of the Safety Committee or a member of the School's management team. If it is desirable, a certain area (e.g. site of an accident) can be inspected on an ad hoc basis.

The Biological Safety Advisor accompanied by the School Biological Safety Officer, the School's Health and Safety Co-ordinator and the College Safety Advisor will inspect a pre-selected and notified area of the School before each Biological Safety Committee meeting.

The College's Health and Safety Office will audit the School every 18months.

It is important that any person noticing hazards or potential hazards should inform the School Health & Safety Co-ordinator immediately so that an inspection can be made.

3.16 REGULAR TESTING AND/OR MAINTENANCE OF EQUIPMENT OR INSTALLATIONS

(a) Air flow in fume cupboards and hoods

The air flow across the face of each fume cupboard and the hoods in laboratories are monitored annually. The result and grading for each fume cupboard are displayed on the front face of the cupboard. Maintenance of the ducted fume cupboards is the responsibility of Campus Services. Records are issued to the Technical Operations Manager by Campus Services.

(b) Autoclaves

Autoclaves in Bourne 3-15 are maintained checked regularly by central services staff along with an annual maintenance visit by an outside qualified contractor. Each autoclave is given a full, independent safety inspection annually by the College insurers includes the pressure vessels, valves and gauges. The two autoclaves in Bourne 3-15 and the one in Bourne 3-02d used for waste disposal are validated yearly. This is arranged by the Technical Operations Manager and records are kept by central services and the Technical Operations Manager..

Other Autoclaves in or associated with research laboratories, including portable machines, are the responsibility of the PI or supervisor who must ensure regular checks or maintenance visits.

All these machines are given a full, independent safety inspection annually by the College insurers. The inspection includes, valves and gauges, this is arranged by arranged by the Technical Operations Manager and records are kept by the Technical Operations Manager.

(c) Ultracentrifuges

Centrifuges are checked regularly by the technical staff and those under maintenance contract are checked along with the rotors by the service company's staff. This is arranged by Fiona Purse or Steve Richards and records kept by the Technical Operations Manager. The centrifuges should only be used after the supervising technician is satisfied with the competence of the proposed operator **(see section 3.11)**.

(d) Lift

The lifts in the Bourne and Wolfson Buildings are given an annual safety inspection by an outside company through Campus Services. You should not travel in the lift with liquid nitrogen. Lifts should not be used in the event of a fire as there is the chance of electrical or mechanical failure.

(e) Alarm bells, fire extinguishers smoke detectors

Campus Services arrange for the testing and, maintenance of fire alarm bells, smoke detectors fire extinguishers and emergency lighting Whenever an extinguisher is fired or fire blanket used, the fact

should be reported to the School Health & Safety Co-ordinator or deputy so that it can be replaced if necessary.

(f) Microbiological Safety Cabinets and Laminar Flow Cabinets

These units are serviced annually and KI discus tested if required; this is organised by the Technical Operations Manager. Records are kept by the Technical Operations Manager.

3.17 OTHER CODES OF WORKING PRACTICE

The Schools Codes of practice/procedures with respect to other potentially hazardous substances and procedures will be developed, and distributed to PIs, supervisors or managers.

The following School procedures and codes of practice are under development and/or revision.

- 1. Procedures for the safe use of fume hoods.**
- 2. Procedures for the safe use of Class II safety cabinets and laminar flow hoods.**
- 3. Code of practice for the handling and use of cryogenic liquids.**
- 4. Code of practice for the movement and storage of large liquid nitrogen tanks.**
- 5. Code of practice for the safe use of gas cylinders and regulators.**
- 6. School's Working at Height Policy and Procedures.**
- 7. School's Driving and Vehicle Policy and Procedure.**
- 8. School's Policy and Procedure for the Acquisition of Controlled Substances.**