RISK ASSESSMENT – TASK BASED
IGEM 2016

Location: *Room W301, Medical Building*	**Building Number:** 181	**Date:** February 2016	**Assessed By:** Amber Willems-Jones	**Health & Safety Representative:** Vincé Kalangi

Description of Activity: **2.3 DEALING WITH SPILLS OF A BIOLOGICAL NATURE:** **Spillage of biological materials e.g. *bacterial culture, recombinant DNA,*** **SWP No:**2.3	
Is there past experience with the Activity that may assist in the risk assessment? Incidents & Near-hits, Incident Investigations, Workplace Inspections, Training, Standards, Legislation & Codes, Uni Guidance Material, Existing Controls, Industry Standards.	NO

1.TASK	2.HAZARD	3.Estimated RAW RISK SCORE C x E x L	4.CONTROLS	5. Residual Risk Score RISK SCORE C	E	L	C x E x L	6. Residual Risk
Spill in laboratory area Cover the spill with absorbent material soaked in suitable disinfectant. (Hypochlorite solution with a concentration of 1.0% available chlorine (10,000 ppm.), 80% v/v ethanol.) Pour disinfectant solution around the spill, leave 10-30 minutes. Wipe surrounding area using disinfectant solution.	Contamination of laboratory and equipment.	1x2x0.5 = 1 LOW	Contain and clean up spill as quickly as possible.	1	2	0.1	0.2	LOW
	Danger of infection of lab workers.	1x2x0.5 = 1 LOW	Wear PPE (lab coat, chemical resistant gloves, safety glasses and mask, P2). Notify all persons in immediate area and vacate area for 30 min. to allow dispersal of aerosols.	1	2	0.1	0.2	LOW

Mop up the spillage and disinfectant solution and transfer all contaminated material to an appropriate waste container. Decontaminate waste, shoes, gloves and clothing.	Hypochlorite (Diversol) causes skin burns and damage to eyes. Contact with acids liberates toxic gas.	3x2x1 = 6 LOW	Prepare disinfectant solutions in fumehood.	3	2	0.1	0.6	LOW
	Ethanol is flammable	1x2x0.5 = 1 LOW	Avoid naked flames	1	2	0.1	0.2	LOW
	Contamination of natural flora with modified organisms.	0x2x0.1 = 0 LOW	Ensure that material used to clean up spill and contaminated PPE is decontaminated prior to leaving the building.					LOW
		TOTAL = 9					**TOTAL** = 1.2	
Spills inside biological safety cabinets Assess scope of spill. Cover the spill and immediate area with absorbent material and a suitable disinfectant (see above), stand for at least 10 min. Disinfect gloved hands, replace contaminated PPE for remainder of clean up. Place contaminated PPE, culture bottles, Petri dishes and solid material responsible for the spill into the same waste container. Remove for decontamination. Wipe down the cabinet work	Hazards and risks as described above.	TOTAL = 9 LOW	Wear PPE (lab coat, chemical resistant gloves, safety glasses and mask, P2). Ensure that the cabinet remains operating to retain aerosols. Avoid naked flames. Prepare disinfectant solutions in fumehood. If the spillage is large or involves a highly infectious microorganism, cabinet may need to be decontaminated with formaldehyde gas by qualified staff before further use.				TOTAL = 1.2	LOW

zone and equipment with fresh disinfectant solution.								
Spill inside centrifuge Switch off the instrument. Check for breakages through the transparent rotor or bucket cover before opening and removing rotor to biological safety cabinet. Open rotor and remove unbroken and capped tubes and wipe with disinfectant. Replace the rotor or carrier lid for transport to the autoclave. Remove lid and autoclave at 121 C for 15 minutes. Remove broken or open tubes and clean outside and inside of centrifuge with an appropriate detergent. Replace rotor.	Hazards and risks as described above.	TOTAL = 9 LOW	Wear PPE (lab coat, chemical resistant gloves, safety glasses and mask, P2).				1.2	LOW
	Electrical hazard.	5x2x0.5 = 5 LOW	Switch off centrifuge and remove plug from socket. Inform the Laboratory Safety Officer of any centrifuge breakages. Contact the Environment Health and Safety Unit for guidance.	5	2	0.1	1	LOW
	Heat, steam under pressure.	10x2x3 = 60 LOW / MEDIUM	Read autoclave guidelines. Only trained users should operate the autoclave. Wear PPE provided including heat proof gloves.	10	2	0.1	2	LOW
	TOTAL	74 = LOW / MEDIUM		TOTAL			4.2 LOW	
Name & Signature of Laboratory Head/Supervisor or Delegate	? k `cp Ugjjc k q Hm l cq			Date				

	SAFE WORK PROCEDURE **IGEM 2016**
Name of Laboratory/Department	The University of Melbourne IGEM Team Laboratory, Department of Biochemistry
Author, Date prepared and Date of Review	Author: Ella Bocquet-Gaylard Date: 22/2/2016 Updated : February 2016, Review by: February 2018
Introduction	This set of safe work procedures deals with cleaning up of spills of biological material e.g. bacterial culture, recombinant DNA, viral cultures, tissue culture in different areas of PC2 laboratories including benches, floor, biological safety cabinet and centrifuges.
Principles / Scope	Containment, disinfection and disposal of biological waste.
Risk Management/risk level for procedure	***Risk assessments have been prepared and are available attached to the SWP.*** ***Raw Risk level:***LOW / MEDIUM ***Residual risk level***: LOW
Safety Management	Hazards: Contamination of laboratory and equipment, PPE and shoes. Contamination of natural flora with genetically modified organisms (GMOs). Hypochlorite and Diversol cause skin burns and damage to eyes. Contact with acids liberates toxic gas. Ethanol is flammable. Risk Controls: Notify all persons in immediate area and vacate area for 30 min to allow dispersal of aerosols. Wear PPE (lab coat, chemical resistant gloves, safety glasses and mask, P2) at all times. Avoid naked flames. Prepare disinfectant solutions in fumehood. Store ethanol in spray bottle.
Licences / Permits	N/A
Training / Competency	Follow PC1 laboratory standards and restrictions. All team members must be inducted into the laboratory and the use of laboratory equiptment.
Equipment	A Selection of disinfectants is listed below: Sodium hypochlorite 1% v/v (available chlorine, 10,000ppm) Ethanol 80% v/v

TYPE OF MICROORGANISM	**EFFECTIVE DISINFECTANT**
Gram positive bacteria (non sporing)	Any potent bactericide
Gram negative bacteria	Alcohols, halogens, phenolics
Acid fast bacteria	Alcohols, aldehydes, halogens, phenolics

Protocol	Dealing with Spillage of biological materials **1. SPILL IN LABORATORY AREA (BENCH, FLOOR)** **Hazard: Contamination of laboratory and staff in area; disinfectant damage to skin and eyes, possible flammable solution.** Cover the spill with absorbent material (e.g. paper towels) soaked in disinfectant. Pour the disinfectant solution around the spill and allow 10-30 minutes to effect disinfection. Wipe surroundings likely to have been contaminated with aerosols using the disinfectant solution. Carefully mop up the spillage and disinfectant solution and transfer all contaminated objects and liquids to a waste container for contaminated material. (eg Double autoclave bags or Biocan for sharps) Decontaminate shoes, gloves and clothing. 1% v/v hypochlorite solution or 80% v/v ethanol is recommended for this procedure. **2. SPILLS INSIDE BIOLOGICAL SAFETY CABINETS** **Hazard: Contamination of laboratory and staff in area; disinfectant damage to skin and eyes, possible flammable solution** Ensure that the cabinet remains operating to retain aerosols. Cover the spill and immediate area with solution of a suitable disinfectant and leave untouched for a minimum of 10 minutes. Disinfect gloved hands, remove protective gloves and clothing for autoclaving and wash hands and arms. Put on a clean set of protective clothing and double gloves for carrying out the remainder of the clean up. After initial inactivation of the spillage, remove excess fluid with absorbent material and discard into a container for removal. Discard culture bottles, petri dishes and solid material responsible for the spill into the same container. Remove for autoclaving culture media and disposable materials adjacent to the spill and contaminated by it. Wipe down the work floor, cabinet work zone and remaining items of equipment with fresh disinfectant solution. Disinfect the front grille and work floor within the cabinet. Check that the spillage has not contaminated the sump. If contaminated, add sufficient disinfectant solution to completely cover it. If the spill is large, use sufficient disinfectant to dilute and inactivate the infectious material. If the spillage is large or involves a highly infectious microorganism, consider whether the cabinet should be decontaminated with formaldehyde gas before further use. This is to be done by qualified service personnel. **3. SPILL INSIDE CENTRIFUGE** **Hazard: Contamination of centrifuge, laboratory and staff in area; disinfectant damage to skin and eyes, possible flammable solution, electrical hazard** If a breakage is obvious or suspected while the centrifuge is still running, stop the run and switch off the instrument. Always inspect centrifuge buckets for breakages of tubes through the transparent rotor or bucket cover before

	opening. If the rotor or bucket lid is removed before discovery of the breakage, replace lid immediately. Inform the Departmental and Laboratory Safety Officer of any centrifuge breakages. Consult the centrifuge manual for directions on the removal of centrifuge rotor or carrier with its cover still on. Wear PPE (laboratory coat, disposable gloves, mask and safety glasses.) Open rotor or carrier in a biological safety cabinet. If appropriate, recover the contents of the unbroken capped tubes inside the biosafety cabinet by carefully wiping the outside of the tubes with a suitable disinfectant and placing specimens in clean containers. Replace the rotor or carrier lid for transport to the autoclave. Remove lid and autoclave at 121°C for 15 minutes. Use forceps or cotton swabs to carefully pick up debris and discard into a sharps container. Clean centrifuge rotor with an appropriate detergent. Disinfect the inner surface of the centrifuge with an appropriate disinfectant e.g. 80% ethanol, v/v. Replace rotor in centrifuge. Fill out an incident form
Controls / Calibration	Ensure that chemical decontamination agents are not past their expiry date. Ensure regular electrical testing of centrifuge and regular servicing of
	Biological safety cabinets.
Waste Disposal	Appropriate Biohazard disposal after decontamination
Emergency Procedures	In case of major spill notify Amber and if appropriate fill out the correct incident report forms.
References	
Authorised by	Amber Willems Jones