Background

A student in an undergraduate laboratory class has been involved in an incident that required first aid and referral to a hospital. This has prompted a review of the experiment that was being undertaken by the class. As laboratory manager, it is your responsibility to liaise with the subject coordinator to make sure that the appropriate documentation is up to date and that the incident is investigated.

Task

You have been provided the following documents for response and review

- Incident report
- Subject risk assessment
- Chemical risk assessment
- Standard Operating Procedures

Some of the documents will have a clear lack of information and procedures. You will be marked on how well you communicate the required information in the documents, as well as the information you include. A copy of the rubric follows on from this.

Submitting your completed work

When you are ready to submit please combine your files into ONE pdf and follow the naming convention below

SURNAME_Student#_Scenario Number

	Excellent	Good	Poor	Very Poor	Not evident / no attempt
	5	4	3	2	1-0
Incident Report 5 Marks	 Identifies and outlines in sufficient detail 3 or more reasonably practicable corrective measures Provides significant detail about the post incident investigation 	 Identifies and outlines at least 3 reasonably practicable corrective measures Provides appropriate detail about the post incident investigation 	 Identifies at least 2 reasonably practicable corrective measures but there are some that are inappropriate Provides limited detail about the post incident investigation 	 Identifies at least 2 corrective measures but there are some that are inappropriate No mention of investigative measures 	 Very little or no attempt has been made to satisfy this criterion
SWMS or SOP	 Procedures have all the required steps and include appropriate control measures. 	 Procedures for work have the correct steps and / or include some control measures 	 A brief method has been provided but is lacking sufficient detail or control measures 	 Method provided is unclear and does not include reasonable control measures 	 Very little or no attempt has been made to satisfy this criterion
5 Marks	 Reference materials are correct and appropriate Approx. 100% of the 	 Reference materials are somewhat correct and appropriate (e.g SDS for the wrong concentration 	 An attempt has been made to find suitable reference materials 	 Reference materials included but inappropriate 	
	hazards and inherent risks have been correctly identified.	of chemical) Approx. 75% hazards and inherent risks have 	 Approx. 50% of the hazards and inherent risks have been correctly identified. 	 <50% of the hazards and inherent risks have been correctly identified. 	
	 No inconsistencies between SOP / SWMS and risk assessment 	been correctly identified. Some may have been overlooked	 Some inconsistencies between SOP / SWMS and risk assessment 	 Significant inconsistencies between SOP / SWMS and risk assessment 	
		 Minimal inconsistencies between SOP / SWMS and risk assessment 			

Risk Assessments 5 Marks	 The control measures specified are realistic and are the most efficient way of reducing the risk to its minimum level. Approx. 100% of the hazards and inherent risks have been correctly identified. 	 Most of the control measures specified are realistic and are the most (or almost the most) effective way of reducing the risk level. Approx. 75% hazards and inherent risks have been correctly identified. Some may have been overlooked 	 Control measures have been included however they are not the most effective or realistic options open to the student. A number of control measures have been overlooked/neglected Approx. 50% of the hazards and inherent risks have been correctly identified. 	 Very few control measures have been included, and if they have been included, they are either too basic, unrealistic or completely inefficient. <50% of the hazards and inherent risks have been correctly identified. 	 Very little or no attempt has been made to satisfy this criterion
Communication Skills 5 Marks	 Students display an excellent ability to communicate effectively and professionally. They have successfully determined what information is important and avoided superfluous information. There are no (or very few) spelling, grammatical or typographical errors (< 2) 	 Students have displayed a sound ability to communicate effectively and professionally. There may be some small errors in the choice of information. There may also be some errors (2-5), whether they be spelling, grammatical or typographical 	 Students have displayed a poor ability to select and communicate information. It is clear that superfluous information has been included, or key information has been neglected. There are a number of errors throughout the work (5-8) and their professional writing skills need to be improved. 	 Students have not been able to effectively convey the information, although an attempt to do so has been made The majority of the work may include superfluous information, or multiple key points may have been left out. There are a large number of errors throughout the work (> 8). 	 Very little or no attempt has been made to satisfy this criterion.

Work Health & Safety Incident Report Form

PART A – Details of the incident

Details of the person completing the report	Name: Alison Beard
	Contact phone number: 0444 567 890
	Email address: alison.beard@lab.co
	Department / Work Area: BioScience Undergraduate Teaching

Time and date of incident 9:25 am on 12/07/2020			
Location of incident	Microbiology Teaching Lab 4 – Building 10 Level 2B		
Activity being undertaken	Experiment 2 – Analysis of Biomolecules		
Brief description of incident / near miss	Student was dispensing "Conc Sulfuric Acid" into a test tube and the acid splashed onto the students face and arms		
Names and contact details for witnesses to the incident	Lab Partner – Bonnie Clover – bonnie.clover1@student.lab.co Tutor – Alison Beard – alison.beard@lab.co Bystander – Daniel Ember – dan.ember@lab.co		
Was anyone injured	\Box No (skip to Part C) X Yes (complete Part B for each injured person) How many: _1 person		

Signature: /

Beard

Date: 12/ 07/ 2020

Submitted to: Dr Eric Frauhauser – Subject Coordinator (Biomolecules) 12/07/2020

Mr Phil Querry – Laboratory Manager 12/07/2020

PART B – Details of injury

* N.B. If more than one perso	has been injured in this incident, please attach an additional part B for each injured person

Details of injured person	Name: Claudia Darcy Gender: \Box Male X Female Date of Birth: 10/06/2001
Contact Details	Work phone Home phone Mobile 0444 123 456 Email: claudia.darcy@student.lab.co
Relationship with department	Employee Contractor Visitor X Other (please specify) – First year student
If Employee; provide details	Position Title: Department / Work Area: Type of Employment: Full time Part time Day shift Night shift WorkCover claim be lodged? Yes No Unsure Work cycle:- Journey Meal or rest break Work

Mechanism of Injury (indicate all relevant)	Slip/trip/fall Manual handling Body stressing Being hit by falling object				
	Hitting an objects with part of the body Being hit by moving objects				
	Exposure to heat /radiation /electricity Exposure to biological agent (including body fluid)				
	${\sf X}$ Exposure to Chemical agent \Box Exposure to asbestos \Box Exposure to work stress				
Violence Other inappropriate behaviour					
	Other (please specify)				

Nature of Injury (indicate all relevant)	□ Sprain/Strain □ Fracture □ Cuts/Scratch/Abrasion □ Bruising X Burn □ Bite/Sting □ Electrical shock □ Concussion X Psychological □ Other (please specify)
Bodily Location/s	Indicate which areas of the body sustained the injuries e.g. left lower leg and ankle Face – under eyes and cheeks – both sides Arms – left and right forearm
Treatment required (highest level only)	No treatment First Aid Doctor Hospital outpatient X Hospital admission Other (please specify) Provide details below: Basic first aid administered by Daniel Ember, safety shower and eyewash for 20 minutes whilst removing contaminated clothing. Security called by Alison Beard and ambulance called and student was taken to hospital.

Signature: AJBeard

Date: 12/ 07/ 2020

Name: Alison Beard

PART C – Investigation

Time and date of incident:

* N.B. Investigations are usually conducted/coordinated by the supervisor/manager.

Is this a notifiable incident? (refer to <u>SafeWork NSW</u>)	Yes. Notify SafeWork NSW. Date Notified://
Investigation Methods	□ interviews □ written statements □ examination of accident site □ CCTV review □ Other (please specify)
Brief Summary of findings (refer to attachments if necessary)	
Causal factors identified (refer to the Work Health & Safety Incident Investigation Guide for definitions of causal factor categories)	People: Equipment/plant: Environment: Organisational factors:

Recommendations (refer to the Work Health & Safety Incident Investigation Guide for	Elimination:
hierarchy of control definitions)	Substitution:
	Isolation:
	Engineering:
	Administrative:
	Personal protective equipment:
Will recommendations eliminate all hazards?	□Yes □No
Investigator Name:	Signature: Date://
Submitted to Health & Safety I	Representative (HSR):
Name:	Position: Date://

PART D – Actions

Time and date of incident: _____: _____am/pm on ____/___/

* N.B. Actions are usually coordinated by the supervisor/manager.

Confirmation of actions	Are all recommendations accepted? Yes No					
	Note exceptions:					
Additional actions to be						
Actions completed	Are all actions completed? Yes No					
Transfer to the risk	All remaining hazards transferred to the risk register for monitoring/review: Yes No					
Outstanding actions	All outstanding actions noted against hazards in the risk register: Yes No N/A					
Communication	□ Incident reporter notified of outcomes on//					
	Relevant committee notified of incident and outcomes on//					
	Copy of this complete WHS incident form sent to					

Supervisor/Manager Name: ______

Supervisor/Manager Signature: _____ Date: ____ / ____ / ____

CHEMICAL RISK ASSESSMENT

STEP 1 – ENTER INFORMATION ABOUT THE ACTIVITY/TASK, ITS LOCATION AND THE PEOPLE COMPLETING THE RISK ASSESSMENT							
Location name: Microbiology Teaching Lab 4 Building No.: 10 Leve		el 2B Room No.: 21	Date: 8	8/2/2017	Assessed by: Dr Eric	Frauhauser	HSR/Employee representative:
							Mr Mark Chan
Chemical (Manufacturer's name and product name	:		Is the chemi	cal a hazardous su	bstance?	If "yes" list the hazard statement:	
Sulfuric Acid 98% - Ajax		Yes 🔲 No			Danger – Causes severe skin & eye damage, May be corrosive to metals		
Is the chemical a dangerous good?	If "yes" list the dangerous go	ods class: Is the chemical a scheduled poison?		If "yes" list the poison schedule:			
Yes 🗆 No	8 - Corrosive		∐ Yes ∠	No			
Description of work/activities/use: For use in under	graduate teaching						
Are there any licensing/permit requirements?	If "yes" provide details:		Health Nil	surveillance requi	rements (list "nil" if r	ot required):	A current SDS is available
Exposure route of chemical:							
Workplace conditions (Describe layout and physical	conditions - including access a	and egress): General ad	ccess teaching la	aboratory, with un	impeded fume hood a	ccess	
What are the storage requirements? Heat resistant	et with bunding	What are the	waste/disposal re	quirements?			
List systems of work for the activity/task:		Students - supervised	l while using the	e chemical			
• Training • Ir	spections	Existing controls – used in fume hood only					
• SOPs • E>	isting controls	SOP - available in database					
• Emergency situations	C C						
Is there past experience with the chemical that may	assist in the assessment?	SOP					
• Existing controls • SOPs	 Standards 	Existing controls					
Industry standards Incidents & near-hits	 Legislation & Codes 						
Training Incident Investigatio	Guidance material						
First aid and emergency requirements	Emergency eyewash	and safety show	ver				
Additional first aid kit contents Special first aid requirements (e.g. oxygen)		Spill kit					
Emergency eyewash Emergency sl							
Spill kit Neutralising agent	 Restrict access 						

STEP 2: RISK RATING – RISK MATRIX AND DEFINITIONS

	Consequence								
		Insignificant	Minor	Moderate	Major	Severe			
	Almost certain	Medium	High	High	Extreme	Extreme			
Likelihood	Likely	Medium	Medium	High	Extreme	Extreme			
	Possible	Low	Medium	Medium	High	Extreme			
	Unlikely	Low	Low	Medium	High	High			
	Rare	Low	Low	Low	Medium	High			

Likelihood	Consequence
Almost certain – will occur in most circumstances when the activity is undertaken (greater than 90% chance of occurring)	Insignificant –First aid treatment, minor injury, no time off work
Likely - will probably occur in most circumstances when the activity is undertaken (51 to 90% chance of occurring)	Minor – Single occurrence of medical treatment, minor injury, no time off work
Possible – might occur when the activity is undertaken (21 to 50% chance of occurring)	Moderate – Multiple medical treatments, non-permanent injury, less than 10 days off work
Unlikely – could happen at some time when the activity is undertaken (1 to 20% chance of occurring)	Major – Extensive injuries requiring medical treatment (e.g. surgery), serious or permanent injury/illness, greater than 10 days off work
Rare – may happen only in exceptional circumstances when the activity is undertaken (less than 1% chance of occurring)	Severe – Severe injury/illness requiring life support, actual or potential fatality, greater than 250 days off work

	Risk Rating Priority for Action									
	Risk acceptance guide	Action	Recommended action time frame							
		Cease or isolate source of risk	Immediate							
Extreme	Not acceptable	Implement further risk controls	Up to 1 month							
		Monitor, review and document controls	Ongoing							
High	Generally (in most circumstances) not accentable	Implement risk controls if reasonably practicable	1 to 3 months							
i iigii	Generally (In most circumstances) not acceptable	Monitor, review and document controls	Ongoing							
Madium	Conorally (in most circumstances) accontable	Implement risk controls if reasonably practicable	3 to 6 months							
Medium	Generally (in most circumstances) acceptable	Monitor, review and document controls	Ongoing							
Low	Acceptable	Monitor and review	Ongoing							

STEP 3 – REVIEW CHEMICAL PROCESS			
For each stage of the chemical risk assessment:	Hierarchy of Control (Control Type)		
 Review the prompts/examples for each route of exposure for each category; 	El – Elimination		
• Determine and record an inherent risk using the risk matrix;	S – Substitution		
 In the comments box, describe the route of exposure and any other information (if applicable); 	En – Engineering Is – Isolation		
• Specify the risk control type for each current or proposed risk control;	A – Administrative T – Training In – Inspection		
Provide a control description for each current or proposed risk control;	M – Monitoring H – Health Monitoring		
• Determine the residual risk using the risk matrix.	P – PPE		

Category		Inherent Risk	Comments (when/where the exposure is present)	Control Type	Control Measures (Current and Proposed)	Residual Risk
Storage						
 Inhalation 	 Skin (absorption 					
• Eye	 Ingestion 	17.5				
 Injection 	• Other					
Handling		N1/A				
 Inhalation 	 Skin (absorption 	N/A				
• Eye	 Ingestion 					
 Injection 	Other					
Decanting/Mixing		N/A				
 Inhalation 	 Skin (absorption 					
• Eye	 Ingestion 					
 Injection 	Other					
Applying/Using			• Students use the acid 4 times during the practical	• P, E	1mL dispenser	
Inhalation	 Skin (absorption 	Medium	session, in the tume hood. • Teaching staff may demonstrate the use of the			low
• Eye	 Ingestion 		dispensing apparatus			
 Injection 	Other					
Spill/Leak			Skin and eye contact can cause serious burns	• P	Gloves are required in addition to usual PPE	
 Inhalation 	 Skin (absorption 	Medium				Low
• Eye	 Ingestion 					
 Injection 	Other					

Category		Inherent Risk	Comments (when/where the exposure is present)	Control Type	Control Description (Current and Proposed)	Residual Risk
Disposal						
Inhalation	 Skin (absorption 					
• Eye	 Ingestion 					
 Injection 	Other					

STEP 4 – IMPLEMENTATION AND CONSULTATION PROCESS

Determine the person responsible for reviewing and implementing the risk assessment including the identified controls.

Obtain the authorisation of the management representative.

Ensure the HSR (if applicable) has been consulted. Ensure the employees undertaking the activity have been consulted.

Record below the names of the persons consulted.

Management representative	Phil Querry	HSR/Employee representative	Mark Chan
Employee(s)	Dr Eric Frauhauser	Employee(s)	
Employee(s)		Employee(s)	
Person Responsible for implementation or escal	ation Dr Eric Frauhauser & Phil Querry		

ADDITIONAL WRITING SPACE

Risk assessment for subject has been completed, as has an SOP for the procedure. Both are available in the database

DATE: 8/2/2017 VERSION NO.: 1	REVIEW DATE: 8/2/2018	AUTHORISED BY: Phil Querry
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Subject Risk Assessment – Biomolecules (98765)

Location: Microbiology Teaching Lab 4 – Building 10 Level 28 Date Carried Out: 2/3/2017 Conducted by: Dr Eric Frauhauser – Subject Coordinator (Biomolecules)

Hazard e.g. chemical, electrical	What is the harm that the hazard could cause?	What is the likelihood that the harm would occur?	What is the level of risk?	How effective are the current controls?	What further controls are required?	Actioned by	Date Completed	Review due
Chemical - Weigh accurately 10 mg (0.010 grams) of crystalline Potassium ferricyanide [K ₃ Fe(CN) ₆]	Contact with acid can liberate toxic gas (Hydrogen cyanide)	Possible	Low	Substance is kept away from any acids. Amount used is very small, and supervision is adequate	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018
Chemical – Conc sulfuric acid (1mL) added by dispenser into test tube	Causes severe burns, risk of serious eye damage	Likely	High	Appropriate PPE to be worn. Reagent to be kept in the fumehood	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018
Chemical – 5% alcoholic α- naphthol 2 drops added to test tube	Harmful in contact with skin and if swallowed. Risk of serious eye damage	Likely	Moderate	Appropriate PPE to be worn	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018

Chemcial – Hexane 3mL & 1.5mL	Highly flammable. Skin irritant. Prolonged exposure via inhalation causes serious damage	Possible	Moderate	Appropriate PPE to be worn. Solution to be kept in the fumehood Dispose of any hexane contaminated waste in the appropriate waste stream	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018
Chemcial – Trypsin 0.5mL added to test tube	Risk of serious eye damage	Unlikely	Low	Appropriate PPE to be worn	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018
Chemcial – Trichloroacetic acid (TCA) 2.5mL added to test tube	Non combustible but will liberate irritating fumed if alight. Corrosive if in contact with skin or eyes. Respiratory irritant	Possible	Moderate	Appropriate PPE to be worn. Solution to be kept in the fumehood	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018
Thermal – Heating block set to 100°C	Burns if in heating block in contact with skin. Scald	Likely	Moderate	Appropriate PPE to be worn.	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018

Trypsin heated to boiling point in test tube	from steam of boiling liquid			Signage warning of hot surface Supervision by teaching staff at all times				
Chemical – 3% hydrogen peroxide solution	Poses no hazard at this concentration	Unlikely	Low	Nil	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018
Chemical – 5mM phosphate buffer	Poses no hazard at this concentration	Unlikely	Low	Nil	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018
Chemcial – lodine solution 0.1mL added to test tube and vortexed	Skin irritant	Possible	Low	Appropriate PPE to be worn.	Nil	Dr E. Frauhauser	2/3/2017	2/3/2018

CONSEQUENCE

			Insignificant	Minor	Moderate	Major	Catastrophic
		Injury/illness consequence	Non-injury incident	Injury/ill-health requiring first aid	Injury/ill-health requiring medical attention	Injury/ill-health requiring hospital admission	Fatality or permanent disabling injury
		Environmental consequence	Minor effects on biological or physical environment	Moderate short-term effect but not affecting ecosystem functions	Serious medium-term environmental effects	Very serious long-term im ecosyster	pairment of ecosystem of n function
	Almost certain	The event will occur on an annual basis	Moderate	High	High	Critical	Critical
)	Likely	The event has occurred several times or more in your career	Moderate	Moderate	High	High	Critical
	Possible	The event might occur once in your career	Low	Moderate	Moderate	High	High
	Unlikely	The event does occur somewhere from time to time	Low	Low	Moderate	Moderate	High
-	Rare	Heard of something like this occurring somewhere	Low	Low	Low	Moderate	Moderate

STANDARD OPERATING PROCEDURE

Procedure:	Analysis of Biomolecules – Molisch Test				
Department:	BioScience Undergraduate Teaching				
Prepared by:	Dr Eric Frauhauser				
Version:	1 (2017)				
Section 1 - Perso	nal Protective Equipment				
1. Labcoat -	- fabric not disposable				
2. Safety gla	asses				
3. Gloves –	nitrile preferred				
4. Fully enc	losed shoes				
Section 2 – Pote	ntial Hazards + Safety precautions				
1. Contact/	Absorption – Sulfuric acid has high potential to cause serious burns and irritation to skin and				
eyes					
2. Inhalatio	n – corrosive gases/vapour can damage lining of the lungs				
3. Ingestion	 – severe irritation (nausea, vomiting and diarrhoea) and permanent damage to 				
gastroint	estinal tract				
4. Other ha	zards – may react with other substances and generate/evolve heat				
Section 3 – Proc	edure				
1. Take 2ml	of sample solution in dry test tube.				
2. Take 2ml	2. Take 2ml of distilled water in another tube as control.				
3. Add 2-3 c	Add 2-3 drops of Molisch's reagent (5% alcoholic α -naphthol) to each of the test tubes				
4. Using a d	ispenser, deliver 1ml conc. H_2SO_4 along the side of the tube so that two distinct layers are formed.				
5. Observe	colour change at the junction of two layers.				
Section 4 – Snill	Procedure and Waste Disposal				
1. Dispose c	if liquid waste in the appropriate waste container (Non-halogenated hydrocarbons) and rinse test				
tubes wit	h water				
2. Any spill o	of the reagent mixture should be neutralised before cleaning up with paper towel and disposed				
3. Any spill of	ill of acid should be neutralised and cleaned up with absorbent material and disposed of				
, ,	· · ·				
Section 5 – First	Aid				
1. Eye/Skin	contact – use emergency eye wash/shower and flush affected area on body (remove any				
Jewellery) with copious amounts of water for at least 20 mins (do not use neutralising agents on areas). Sook medical advice				
2 Inhalatio	n – Move exposed person to well ventilated area if safe to do so. Seek immediate medical				
advice.					
3. Ingestion	ı – Seek immediate medical advice.				
4. Any injur	ies, incidents or near misses (dangerous situations not resulting in an incident) must be				
reported	to your supervisor and via the online reporting system				
Section 6 Store	and transport				
1 Test room	ige and transport				
I. Test Teag	and Moliceh reagont in DC2 Elemmable liquide supported to be stored in the DG8 Actus				
	and Monsch reagent in DGS Flammable inquids cupboard.				
2. Gioves an	e required when callying bottles of solutions				
3. Secondar	y containment is advised for acid transport, and the use of winchester carriers for large bottles is ,				
Costion 7 Delevent CDC & Deferences					
Section / – Relevant SDS & References					
1. SDS for cl	nemicals available in the laboratory and online database				
2. Refer to t	ne kisk Assessments for sulfuric acid and 5% alcoholic α -naphthol as well as the subject risk				
assessme	nt				

SOP Consultation, Training and Approval

Print names and enter signatures and dates to certify that the persons named in this section have been consulted/trained in relation to the development and implementation of this Standard Operating Procedure. WHS Representative (WHS Committee) certifies that consultation has taken place.

Position	Name	Signature	Date
Subject Coordinator	Dr Eric Frauhauser	EFranhauser	3/2/2017
Laboratory Manager	Mr Phil Querry	PQuery	10/2/2017
Teaching Associate	Alison Beard	AJBeard	10/2/2017
{Insert as needed}			

Authorising Person:

Phil Querry

Date: 10/2/2017

Date: 10/2/2017

Signature: Duerry

WHS Representative: Mark Chan

Signature:

MChan.

Creation Date: 10/2/2017 Las	ast Review: N/A	Next Review: 10/2/2018
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