

## Safety Documentation

Please select the forms you require by selecting the check boxes below.  
You can select more than one.

**Risk Assessment**                       **Method Statement**                       **Chemicals COSHH**

Once you have made your selections, scroll down and complete the forms.

**Buttons:** [+ ] will add a row to a list    [- X ] will delete a row from a list

You may save this file to a local drive at any time.  
When you have finished, save the file to a local drive and email it to your supervisor for authorisation.

**Supervisors** - There is a sign-off section at the end of the document set that must be completed.

**Staff may "self authorise", (as a supervisor), but the forms must still be submitted to the DSO for approval.**

### **IMPORTANT:**

YOU **MUST NOT** START ANY PRACTICAL WORK UNTIL THESE FORMS HAVE BEEN RETURNED TO YOU  
WITH **BOTH** YOUR SUPERVISOR's AND DSO's APPROVAL SIGNATURES ATTACHED.

### Please complete these fields

School or Service	Wolfson School of Mechanical, Electrical and Manufacturing Engineering
Department	Centre for Biological Engineering
Originator name	Sotiria Toumpaniari
email address	s.toumpaniari@lboro.ac.uk
Location	H25, H34
Project / Activity / Task	Fixing biological samples for histological processing using formaldehyde or formalin solution
Supervisor Name	Sotiris Korossis

# Risk Assessment

Reference

Location

Originator

Project / Activity / Task

Is this process risk assessment for a :  Laboratory / Workshop  General use

Category 1: Machinery & work equipment:				
Design and Construction	Mechanical hazards	Electrical hazards	Radiation hazards	
N/A	N/A	Electrical test cables current	Heat(Inc. IR)	+
Category 2: Workplace				
N/A				+
Category 3: Hazardous and/or Harmful substances				
Flammable substances				+
Corrosive substances				X
Sensitising substances				X
Irritant substances				X
Category 4: Work activity				
Lone working out of hours				+
Category 5: Work organisation				
N/A				X

Explain the risks associated with these hazards				
People / Groups at risk	<input type="text" value="Everyone in the room"/>			X
Enter risk details here:-	Impact	Probability	Risk Score	
<input type="text" value="Flammable substances"/>	<input type="text" value="Very Harmful"/>	<input type="text" value="Likely"/>	Unacceptable	
What are the control measures?	Lowers Impact	Lowers Probability	+	
<input type="text" value="Do work away from sources of ignition"/>	<input type="text" value="Significantly"/>	<input type="text" value="Significantly"/>	X	
<input type="text" value="Appropriately label the pots with the chemicals"/>	<input type="text" value="Significantly"/>	<input type="text" value="Significantly"/>	X	
<input type="text" value="Keep/store the pots with chemicals on spill trays"/>	<input type="text" value="Significantly"/>	<input type="text" value="Significantly"/>	X	
			Residual Risk	
			<input type="text" value="Low"/>	
People / Groups at risk	<input type="text" value="Operator only"/>			X

## Process Risk Assessment Form (Continued)

Enter risk details here:- Corrosive substance	Impact Very Harmful	Probability Likely	Risk Score Unacceptable
What are the control measures?	Lowers Impact	Lowers Probability	+
Wear protective equipment - lab coat and gloves	Significantly	Significantly	x
Keep/store the pots with chemicals on spill trays	Significantly	Significantly	x
Appropriately label the pots with the chemicals	Significantly	Significantly	x
			Residual Risk Low
People / Groups at risk	Everyone in the room		x
Enter risk details here:- Irritant substance	Impact Harmful	Probability Likely	Risk Score High
What are the control measures?	Lowers Impact	Lowers Probability	+
Work in the fume hood and wear PPE- lab coat and gloves	Significantly	Significantly	x
Keep/store the pots with chemicals on spill trays	Significantly	Significantly	x
Appropriately label the pots with the chemicals	Significantly	Significantly	x
Appropriately label the pots with the chemicals	Significantly	Significantly	x
			Residual Risk Low
People / Groups at risk	Everyone in the room		x
Enter risk details here:- Sensitiser substance	Impact Harmful	Probability Likely	Risk Score High
What are the control measures?	Lowers Impact	Lowers Probability	+
Work in the fume hood and wear PPE- lab coat and gloves	Significantly	Significantly	x
Appropriately label the pots with the chemicals	Significantly	Significantly	x
Appropriately label the pots with the chemicals	Significantly	Significantly	x
			Residual Risk Low
People / Groups at risk	Operator only		x
Enter risk details here:- Lone Working out of hours.	Impact Slightly Harmful	Probability Likely	Risk Score Medium
What are the control measures?	Lowers Impact	Lowers Probability	+
Lough University Lone working policy to be followed, with the use of thye lone working app and contacting security on occasions of lone working.	Moderately	Moderately	x
			Residual Risk Low

## Process Risk Assessment Form (Continued)

+ Add another Risk

Who may be at risk as a result of this activity?

Personnel Group	Maximum (Task setup/ Re-configuration)	High (Performing the task)	Medium (Observing the task)	Low (Present, but not involved)	Lone Working (Out of hours)	No Exposure Permitted	Total
Academic Staff	0	1	0	0	0	0	1
Technical Staff	0	0	0	0	0	0	0
Research Staff (PDRA)	0	2	0	0	0	0	2
Research Students (PhD)	0	2	0	0	0	0	2
Students (Undergraduate / MSc)	0	0	5	0	0	0	5
Visitors	0	0	0	0	0	0	0
Others - Over-type as needed	0	0	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>5</b>	<b>5</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>10</b>

With these controls in place, the risk is:

**The activity is LOW RISK - and is effectively controlled**

# Loughborough University

## Centre for Biological Engineering

### Safety Method Statement

Reference SAF/MEME 6514

Location H25, H34

Originator Sotiria Toumpaniari

Project / Activity / Task Fixing biological samples for histological processing using formaldehyde or formalin solution

What equipment will be used in this activity?	+
Pipette gun	X
Stripettes	X
Duran bottles	X
Well plates	X
Plastic container	X
Aspirator	X
Biosafety cabinet	X
Fume hood	X
150ml Sterilin pots	X
Spill tray	X

What training must be completed to do this activity?	+
Sharps use	X
Use of chemical substances	X
Use of biological samples	X

What chemicals are being used? (These must be included in the COSHH Form)	+
4% formaldehyde solution	X
Phosphate buffer solution	X
Formalin	X

Spill and accident procedures.	+
Using an absorbent material collect solution and pour it in the waste bottle for the corresponding solution. Used absorbent material should be discarded in the chemical waste and transferred immediately in Pod 2.	X

Procedure in the event of an emergency. (How to leave the process in a safe condition in such an event)	+
Dispose contaminated gloves. Leave note with a name of the operator and state mentioning not to move anything from the area.	X

References.	+
CBE code of practice, SOP004, SOP037, SOP038, SOP039	X

#### Detailed sequential description of the process

Process step	Precautionary measures and comments	+
Wear PPE mentioned above.	Check if PPE is damaged and replace if it is.	X

## Safety Method Statement (Continued)

Process step	Precautionary measures and comments	+
In a biosafety cabinet, aspirate the medium from appropriately labeled pots containing the samples, using aspirator and stripette.	Carefully decontaminate the biosafety cabinet and aspirator before use.	X
Wash samples x3 with PBS.	Avoid spillages by using pipette gun and aspirator.	X
In a fume hood, add enough formalin or pre-warmed 4% formaldehyde solution in labeled pots containing the samples, so that the samples are fully immersed.	Use pipette gun and collect waste in a container only for formalin and formaldehyde waste.	X
Seal the labeled container pots properly and place onto a spill tray or a safety rack.	Seal containers with parafilm.	X
Transfer the spill tray or safety rack with the labeled pots containing the samples onto a bench and leave for 20 min. Time depends on the thickness of sample.	Place pots on a spill tray	X
Wash samples with PBS x3.	Avoid spillages by using pipette gun and aspirator.	X





# COSHH Form

Reference

Location

Originator

Project / Activity / Task

<b>CHEMICAL NAME</b>		   				Hazard Rating <b>High</b>	<b>OVERALL RISK:</b>  <b>Medium</b>
4% Formaldehyde (Paraformaldehyde (4%))  CAS No. <input type="text" value="30525-89-4/ 7647-14-"/>	W.E.L. (Itel / stel) <input type="text"/>	Amount used: <input type="text" value="50"/> ml	Period of use (hrs): <input type="text" value="10"/>	The process is: <input type="text" value="Closed"/>	Physical State: <input type="text" value="Non-Volatile Liquid"/>	<input checked="" type="checkbox"/> Eyes <input checked="" type="checkbox"/> Skin <input checked="" type="checkbox"/> Inhaled <input checked="" type="checkbox"/> Ingested	

This chemical has a high health risk associated with it.

Hazard Statement and Description	Precaution Statement and Description	
H228 Flammable solid.	P210 Keep away from heat/sparks/open flames/hot surfaces.	+
H302 Harmful if swallowed.	P261 Avoid breathing dust/fume/gas/mist/vapours/spray.	x
H332 Harmful if inhaled.	P280 Wear protective gloves/protective clothing/eye protection/face protection.	x
H315 Causes skin irritation.	P301 + P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.	x
H317 May cause an allergic skin reaction.	P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.	x
H318 Causes serious eye damage.	P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.	x
H335 May cause respiratory irritation.	P310 Immediately call a POISON CENTER or doctor/physician.	x
H341 Suspected of causing genetic defects.	P370 + P378 In case of fire: Use dry powder for extinction.	x
H351 Suspected of causing cancer.		x
H412 Harmful to aquatic life with long lasting effects.		x
Justify the use of this chemical:	Proper tissue fixation is essential for accurate histopathologic evaluation. Formaldehyde fixation is thought to form cross links between the aldehydes and the proteins, creating a gel, thus retaining cellular constituents in their in vivo relationship. Once properly fixed, the tissue should be able to withstand the subsequent stages of tissue processing or staining.	
How will the precautions listed above be implemented?		
Containers with 4% formaldehyde solution will be opened only in fume hood. Wear PPE- nitrile gloves, lab coat and goggles.		
Special Storage and Containment Measures	Disposal Method	
Keep container tightly closed in a dry and well-ventilated place. Store in cool place. Recommended storage temperature 2 - 8 °C.	Keep waste of formalin and formaldehyde solution in a single container and when full, transfer it to pod 2.	x
How will spillages be dealt with?	<i>Please note: any material used to clean up a spill of hazardous material must also be disposed of as hazardous material. <a href="#">Click here to see spill procedures</a></i>	
Absorbent cloth / tissue		

# COSHH Form (Continued)

<b>CHEMICAL NAME</b> <b>Formalin solution, neutral buffered, 10%</b>						Hazard Rating <b>High</b>	<b>OVERALL RISK:</b> <b>Medium</b>
CAS No. 50-00-0/ 67-56-1	Amount used 50 ml	Period of use (hrs) 1	The process is: Semi Closed	Physical State Non-Volatile Liquid	<input type="checkbox"/> Eyes <input checked="" type="checkbox"/> Skin <input type="checkbox"/> Inhaled <input checked="" type="checkbox"/> Ingested	Exposure Potential <b>Low</b>	

This chemical has a high health risk associated with it.

Hazard Statement and Description	Precaution Statement and Description	
H302 Harmful if swallowed.	P201 Obtain special instructions before use.	+
H317 May cause an allergic skin reaction.	P280 Wear protective gloves/protective clothing/eye protection/face protection.	x
H341 Suspected of causing genetic defects.	P301 + P330 + P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.	x
H350 May cause cancer.	P308 + P313 IF exposed or concerned: Get medical advice/attention.	x
	P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.	x
Justify the use of this chemical:	Formalin is the preferred fixation solution for histological staining.	
How will the precautions listed above be implemented?		
Containers with formalin solution must be opened only in fume hood. Wear PPE- nitrile gloves, lab coat and goggles.		
Special Storage and Containment Measures	Disposal Method	
Store in cool place. Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.	Collect formalin and formaldehyde waste in a Duran waste bottle and discard it in Pod 2 when is nearly full.	x
How will spillages be dealt with?	<i>Please note: any material used to clean up a spill of hazardous material must also be disposed of as hazardous material.</i> <a href="#">Click here to see spill procedures</a>	
Absorbent cloth / tissue		

+ Add another chemical

### Statement of work (Process to be undertaken)

Cultured cells in suspension or adherent on various substrates or tissue isolated from human/ animal origin will be washed using PBS. Then, the samples will be immersed in 4% formaldehyde or formalin. The time of fixation depends on the size of the sample- cultured cells need 10 min, tissues and organs need from a few hours to days.

Show image

Personal protection requirements not covered in the precaution statements above.

Closed shoes and overshoes (in CBE)

### Sources of information and references

<https://www.thermofisher.com/uk/en/home/life-science/protein-biology/protein-biology-learning-center/protein-biology-resource-library/pierce-protein-methods/fixation-strategies-formulations.html>  
[https://www.sigmaaldrich.com/content/dam/sigma-aldrich/docs/Sigma/Product\\_Information\\_Sheet/2/ht501128pis.pdf](https://www.sigmaaldrich.com/content/dam/sigma-aldrich/docs/Sigma/Product_Information_Sheet/2/ht501128pis.pdf)  
<https://www.sigmaaldrich.com/MSDS/MSDS/DisplayMSDSPage.do?country=GB&language=en&productNumber=HT501128&brand=SIGMA&PageToGoToURL=https%3A%2F%2F>  
<https://www.sigmaaldrich.com/catalog/product/mm/100496?lang=en&region=GB>

### Reference to **existing approved** Risk Assessment



## COSHH Form (Continued)

With the current controls, the risk of using these chemicals is: Medium

Supervisor to check that the process involving the safe use of these chemicals has been satisfactorily evaluated

## Supervisor and Departmental Safety Office (DSO) Sign-off.

### Supervisors

Please check the documents above and if you want to approve them:

- 1) Electronically sign this document
- 2) Save it to a local drive (You will be prompted to do this)
- 3) eMail the signed document to the DSO.

### DSO

Please review the documents above and if you want to approve them:

- 1) Enter the reference numbers as appropriate
- 2) Electronically sign this document
- 3) Save it to a local drive (You will be prompted to do this)
- 3) eMail the signed document to the originator

### IF YOU DO NOT WANT TO AUTHORISE THE FORMS,

Please do not sign the form, but click the "Not Approved" check-box and return it to the originator by email stating why and what you expect them to do to put it right in the comments box below.

Not Approved

Supervisors Signature

### Form Reference Numbers

Risk Assessment

SAF/MEME 6514

Method Statement

SAF/MEME 6514

COSHH Assessment

MEME 700, 701

DSO Signature

### **This document set must be reviewed and re-approved at the following times:**

- 1) After the first occurrence of the activity described above (Review only)
- 2) After any change to the procedure or reagents used
- 3) After any incident resulting from this activity
- 4) At least annually from the date of approval

Next Review:

3 Aug 2021

Review comments