

## Safety Documentation

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

**Method Statement**                       **Risk Assessment**                       **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	Dr Carmen Torres-Sanchez
email address	c.torres@lboro.ac.uk
Location	CBE, lab H23
Project / Activity / Task	Set up of dynamic flow assembly
Supervisor Name	Dr Carmen Torres-Sanchez

# Safety Method Statement

Reference SAF/MEME/7519

Location CBE, lab H23

Originator Dr Carmen Torres-Sanchez

Project / Activity / Task Set up of dynamic flow assembly

What equipment will be used in this activity?	+
Darwin Microfluidics LongerPump BT100	X
Incubator	X

What training must be completed to do this activity?	+
Set up and functioning of the peristaltic pump following the manufacturer's Manual of Operation that came with the pump	X

What chemicals are being used? (These must be included in the COSHH Form)	+
none	X

Spill and accident procedures.	+
n/a	X

Procedure in the event of an emergency. (How to leave the process in a safe condition in such an event)	+
Press the stop button on the pump control panel.	X
Unplug the pump from the socket at the wall. Inform Lab manager and exit lab	X
If fire alarm sounds continuously evacuate the building in a safe and orderly manner. Only return when informed that it is safe to do so	X

References.	+
	X

## Detailed sequential description of the process

Process step	Precautionary measures and comments	
Unpack pump and assemble the 5 heads along the middle shaft of the pump, as per manual's instructions and 'Assembly Guide' attached to this Risk Assessment. Once the heads are assembled, place the pump on the equipment bench (by the wall) closest to the incubator tower.	Ensure lab PPE suitable for purpose is worn and in-line with CBE lab rules Clear workbench to ensure the heads are not knocked off the bench accidentally, because they are fragile	X
Place the assembly bag on the workbench and open it carefully, ensuring none of the small parts and components fall on the floor. Note inlet and outlet sections of the tubing. The inlet tubing section is the shorter section, and where the bag is attached to with the shortest tubing section.		X
Open the incubator and place inside the well-sets (previously autoclaved), the plastic holder, the reservoir (flexi) bag with its corresponding ports, and the inlets and outlets channels (5 each).	ensure the tubing does not get entangled in itself	X

## Safety Method Statement (Continued)

Process step	Precautionary measures and comments	+
Take the inlet section of the tubing (the shortest section) and connect it to the inlet port of the well-sets (5 off) using the click-and-twist mechanism of the luer-locks. The inlet of the well-set sits at the top. Repeat this operation 4 times to have the 5 well-sets connected to the tubing channels. Place the well-sets on the plastic holder.	Plastic holder and well-sets (5) needs to be autoclaved before going into lab H23.  Ensure the connection is watertight, by double-checking the luer-locks.	X
Take the outlet section of the tubing (the longest section) from where it stems out of the reservoir bag. Put it through the incubator back port and lasso it out onto the equipment bench, where the pump awaits.		X
Place each tube channel (5 off) into each of the heads of the peristaltic pump.	Ensure the tubing is not pinched by the positioning mechanism that clamps the tube in place. Take extra care that your fingers (wearing nitrile/latex gloves) don't get trapped in the mechanism either, as the teeth of the triangular jaws are sharp. Ensure the tubings don't get entangled, as this may strangle the internal flow	X
Once each of the channels is in place, take the loose sections, bundle them, and place the bundle back into the incubator via the back port.		X
Take the ends of this outer tubing and connect the 5 tubes to the outlets of the well-set. Click them on in place using the luer-lock mechanism. The outlets of the wells are at the bottom of the design.	Ensure the connection is watertight, by double-checking the luer-locks.	X
Hang or place the reservoir bag so that there is an easy access to its ports, to load up with media culture when the experiment commences	It is very important the bag is not pierced or punctured. Take special care of this.	X
Close the incubator door. The assembly is now ready for operation. See 'SOP/User guide' for Operation Settings.		X
		X
		X
		X
		X
		X
		X
		X

### 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	
CE marking and PAT tested	Entanglement	Electrical test lables current	N/A	+
	Stabbing/Puncturing			X
Category 2: Workplace				
Restricted access				X
Localised hot surfaces				X
Confined work area (striking objects)				X
Slips/Trips/Falls on the level				X
Category 3: Hazardous and/or Harmful substances				
Biological substancees (Infection)				X
Category 4: Work activity				
N/A				X
Category 5: Work organisation				
N/A				X

Explain the risks associated with these hazards				
People / Groups at risk	<input type="text" value="Operator only"/>			X
Enter risk details here:-	Impact	Probability	Risk Score	
<input type="text" value="Machine (pump) entanglement"/>	<input type="text" value="Slightly Harmful"/>	<input type="text" value="Highly Unlikely"/>	Low	
What are the control measures?	Lowers Impact	Lowers Probability	+	
<input type="text" value="This refers to the tubing in and out of the pump head. Ensure these are not entangled with your clothing, body parts and within themselves&lt;br/&gt;Wear PPE appropriate to task"/>	<input type="text" value="Significantly"/>	<input type="text" value="Slightly"/>	X	
				Residual Risk
				<input type="text" value="Low"/>

## Process Risk Assessment Form (Continued)

People / Groups at risk			Operator only	<b>X</b>
Enter risk details here:-		Impact	Probability	Risk Score
Machine (pump) puncturing		Slightly Harmful	Unlikely	Low
What are the control measures?		Lowers Impact	Lowers Probability	<b>+</b>
This refers to the locking mechanism for the pump heads. They have a triangular jaw and sharp teeth. Ensure the tubing is positioned correctly, not trapped in the guiding channel (and applies to fingers/gloves as well). Any electrical equipment with a 240V plug should be within current PAT inspection date		Slightly	Slightly	<b>X</b>
				Residual Risk
				Low
People / Groups at risk			Everyone in the room	<b>X</b>
Enter risk details here:-		Impact	Probability	Risk Score
Restricted Access: Lab H23 in CBE		Slightly Harmful	Highly Unlikely	Low
What are the control measures?		Lowers Impact	Lowers Probability	<b>+</b>
Access to this lab is restricted and a Day-Pass to allow work there has already been requested.		Significantly	Slightly	<b>X</b>
				Residual Risk
				Low
People / Groups at risk			Operator and people in proximity	<b>X</b>
Enter risk details here:-		Impact	Probability	Risk Score
Localised hot surfaces/Confined area		Slightly Harmful	Highly Unlikely	Low
What are the control measures?		Lowers Impact	Lowers Probability	<b>+</b>
This refers to the incubator where the tubing and wells will be placed. The incubator is at 37C and the humidity is ~90%. The side walls of the incubator may be at a higher temperature than that. Ensure PPE is worn and hot sources inside of the incubator (e.g. walls) are not touched is not needed. Confined area, so that working in the incubator cavity does not lead to banging on head(s) or other body parts.		Significantly	Moderately	<b>X</b>
				Residual Risk
				Low
People / Groups at risk			Everyone in the room	<b>X</b>
Enter risk details here:-		Impact	Probability	Risk Score
Biological Substances		Slightly Harmful	Highly Unlikely	Low
What are the control measures?		Lowers Impact	Lowers Probability	<b>+</b>
This refers to the fact that H23 lab is used for cell culture and other biological tests done by other people. By the time this work will take place, no one else will be in the lab, and they should have cleared after them, so there will be no contact with such biological substances. The CBE technical supervisors will ensure this is the case before we walk into the room.		Moderately	Slightly	<b>X</b>

## Process Risk Assessment Form (Continued)

						Residual Risk	
						Low	
People / Groups at risk		Operator and people in proximity				<b>X</b>	
Enter risk details here:-		Impact		Probability		Risk Score	
Slips trips and falls		Slightly Harmful		Highly Unlikely			
What are the control measures?		Lowers Impact		Lowers Probability		<b>+</b>	
Good housekeeping in the area - keep clear and tidy, remove waste in-line with CBE SOP Remove any potential trip hazards from the floor		None		None		<b>X</b>	
						Residual Risk	
<b>+ Add another Risk</b>							

### 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	1	0	0	0	0	0	1
Technical Staff	1	0	1	0	0	0	2
Research Staff (PDRA)	0	0	0	0	0	1	1
Research Students (PhD)	0	0	0	0	0	1	1
Students (Undergraduate / MSc)	0	0	0	0	0	1	1
Visitors	0	0	0	0	0	1	1
Others - Over-type as needed	0	0	0	0	0	1	1
<b>Total</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>8</b>

With these controls in place, the risk is:

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

## 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/7519

Method Statement

SAF/MEME/7519

COSHH Assessment

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:

23 Feb 2024

Review comments