

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	Nicholas Wragg
email address	n.m.wragg2@lboro.ac.uk
Location	Centre for Biological Engineering H25
Project / Activity / Task	Application of ultrasound to mammalian cells
Supervisor Name	Carmen Torres-Sanchez

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	
In-house modified	N/A	Electrical test labels current	N/A	+
Category 2: Workplace				
Other Workplace hazard (Biohazard)				+
Category 3: Hazardous and/or Harmful substances				
N/A				+
Category 4: Work activity				
N/A				+
Category 5: Work organisation				
N/A				+

Explain the risks associated with these hazards				
People / Groups at risk	<input type="text" value="Everyone in the room"/>			+
Enter risk details here:-	Impact	Probability	Risk Score	
<input type="text" value="If PAT is not up to date, the equipment may cause fire"/>	<input type="text" value="Slightly Harmful"/>	<input type="text" value="Highly Unlikely"/>		
What are the control measures?	Lowers Impact	Lowers Probability	+	
<input type="text" value="Visually check for PAT labeling is within date/valid"/>	<input type="text" value="Slightly"/>	<input type="text" value="Significantly"/>	+	
			Residual Risk	
			<input type="text" value="Low"/>	
People / Groups at risk	<input type="text" value="Operator only"/>			+
Enter risk details here:-	Impact	Probability	Risk Score	
<input type="text" value="Electric shock from transducer/water contact"/>	<input type="text" value="Slightly Harmful"/>	<input type="text" value="Highly Unlikely"/>		
What are the control measures?	Lowers Impact	Lowers Probability	+	
<input type="text" value="Check wiring, insulation and shielding/grounding of piezoelectric ultrasound transducers"/>	<input type="text" value="Significantly"/>	<input type="text" value="Significantly"/>	+	
			Residual Risk	
			<input type="text" value="Low"/>	

Process Risk Assessment Form (Continued)

People / Groups at risk		Operator and people in proximity		X	
Enter risk details here:-		Impact	Probability	Risk Score	
Presence of biohazards in the lab		Very Harmful	Highly Unlikely	Medium	
What are the control measures?		Lowers Impact	Lowers Probability	+	
Wear PPE (gloves, lab coat, goggles)		Moderately	Significantly	X	
				Residual Risk	
				Low	
People / Groups at risk		Operator only		X	
Enter risk details here:-		Impact	Probability	Risk Score	
Burns from piezoelectric transducers		Harmful	Unlikely	Medium	
What are the control measures?		Lowers Impact	Lowers Probability	+	
Transducers are housed inside a box prohibiting accidental contact and exposed top of transducer is placed in water for transmission of ultrasound and acts as a coolant. Power will be supplied to the transducers for a maximum of 30 minutes/day to limit temperature increase. Water temperature to be checked during testing to ascertain temperature fluctuations in the water.		Significantly	Significantly	X	
				Residual Risk	
				Low	
People / Groups at risk		Operator and people in proximity		X	
Enter risk details here:-		Impact	Probability	Risk Score	
Cables entangled and spanning across a distance		Slightly Harmful	Unlikely	Low	
What are the control measures?		Lowers Impact	Lowers Probability	+	
Ensure the cables are tidy and, if possible, taped to desk, wall or any other vertical space. Display 'ON' note when running the experiment. Ensure other users have clear space to operate while this experiment is ongoing.		Slightly	None	X	
				Residual Risk	
				Low	
+ 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	0	1	0	0	0	1
Technical Staff	0	0	0	1	0	0	1
Research Staff (PDRA)	1	1	0	0	0	0	2
Research Students (PhD)	0	1	1	1	0	0	3

Process Risk Assessment Form (Continued)

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
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
Total	1	2	2	2	0	3	10

With these controls in place, the risk is:

The activity is LOW RISK - and is effectively controlled

Safety Method Statement

Reference SAF/MM/6366

Location Centre for Biological Engineering H25

Originator Nicholas Wragg

Project / Activity / Task Application of ultrasound to mammalian cells

What equipment will be used in this activity?

+

Ultrasonic waveform generators, power amplifier, piezoelectric transducers, bespoke ultrasound cell sonication platform, thermocouples.

X

What training must be completed to do this activity?

+

Use of ultrasonic generators, amplifiers.

X

What chemicals are being used? (These must be included in the COSHH Form)

+

none

X

Spill and accident procedures.

+

Water spillages should be dealt with a mop and paper towels

X

Procedure in the event of an emergency. (How to leave the process in a safe condition in such an event)

+

Turn off all equipment and leave. Alert lab managers

X

References.

+

Technical documentation: power amplifier type 2713 (Bruel and Kjaer)

X

Risk Assessment: Biocompatibility of Ti scaffolds: A systematic study of in-vitro cytotoxicity and osteoinductive properties of titanium and Titanium-based alloys with different porous architecture CBE BRA 147

X

Detailed sequential description of the process

Process step	Precautionary measures and comments	
Connect piezoelectric ultrasound transducers to power amplifier/ ultrasonic generators. Do not switch on yet.	Ensure that transducer's insulation and shielding is correct.	X
Place water into bespoke ultrasound cell sonication platform to desired depth.	Ensure no leakage from platform.	X
Place bespoke ultrasound cell sonication platform into incubator	To ensure that no water produced from the humidity can travel along the cables to the signal generating equipment, place a cable tie onto or a loop in the cable (lower than the signal generators) outside of the incubator to allow any water to drip from the cables.	X
Place cell culture vessel holder onto bespoke ultrasound cell sonication platform.	Ensure that cell culture vessel holder is level to make certain that sonication is even	X
Place cell culture vessel (i.e. microplate) on the holder on the rig	When using cell culture plates, it is advised that adhesive tape be placed between lid and base of cell culture plate to reduce infection risk from accidental opening.	X

Safety Method Statement (Continued)

Process step	Precautionary measures and comments	+
Turn on signal generators/power amplifier to desired settings (i.e. signal gen frequency 20kHz-1.5Mhz, Ultrasonic generator: 1-2level of power; Amplifier: Resistive load: 31.5 V; Gain 1-60db in increments of 1-10dB; to achieve a power ~30mW/cm ²) for no longer than 30 minutes/day.	Ensure that settings are within tolerances of equipment as signaled by overload indicators	X
Remove cell culture vessel and holder at termination of experiment.		X
Turn off all signal generating equipment before removal of bespoke ultrasound cell sonication platform from incubator at any time.		X
Disconnect all cabling from bespoke ultrasound cell sonication platform before disposing of water via pump or manual pouring down the sink.	Wipe dry with towels	X

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/MM/6366

Method Statement

SAF/MM/6366

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:

18/02/2021

Review comments