



## Risk Assessment Record

<b>Department</b>	Centre for Biological Engineering
<b>Item Description</b>	Bench top, Compact, Thermo Scientific MaxQ™ Mini 4450 Incubator - Shaker
<b>Location</b>	CBE Laboratory Unit - Room H22 (Human Cell Culture Suite - Manual Culture Room)
<b>Date</b>	11.04.2011
<b>Highest Risk Rating</b>	<b>Low Risk</b>
<b>Review Date</b>	<b>11.04.2012</b>

**Risk Assessment Record**

Assessment No. [ SAF/CBE/..... ]

<b>Assessor</b>	Andreea Iftimia		
<b>Comments</b>	<p>Investigating the potential of Mesenchymal stem cells from umbilical cord</p> <p>This project's objectives include developing protocols for the expansion of human mesenchymal stem cells (hMSC's) populations from umbilical cord tissue. Extraction of hMSC's cells from the cord is done via enzymatic digestion of the tissue, followed by the culture (passage and feeding), harvesting, cryopreservation and assessment.</p> <p>The procedure involves working with cryopreserved cord sections/slices, which will be imported from Future Health Technologies Ltd, Nottingham Science &amp; Technology Park, UK NG7 2QP.</p> <p>Digestion of tissue_ The tissue obtained from each slice will be placed into 15ml tubes and an appropriate volume of digestion enzyme, diluted in PBS (phosphate buffer saline), will be added to it. Different digestion enzymes, at different concentrations and combinations will be explored in order to optimize the extraction process of mesenchymal stem cells from the cord tissue. Also various periods of extraction time will be tested.</p> <p>Part of the digestion process is to keep the tubes, that contain the tissue immersed in the digestive enzyme solution, in constant motion approximately at 60-90 rpm, this is necessary in order to provide a better contact of the tissue with the enzyme solution, and at a constant temperature of 37°C. Consequently the tubes containing the cord tissue and digestion solution will be placed in a bench top, compact, Thermo Scientific MaxQ™ Mini 4450 incubator - shaker at 37°C for the entire digestion period of the tissue.</p> <p>It has to be noted that the use of this equipment will replace the need to use the Stuart Mini orbital shaker inside a normal CO2 incubator, therefore the process will be easier and safer, due to the compact and safety features of the THERMO SCIENTIFIC MaxQ™ Mini 4450 incubator-shaker.</p>		
<b>Signature</b>		<b>Date</b>	19-04-2011

<b>Supervisor</b>	Dr. Rob Thomas		
<b>Comments</b>			
<b>Signature</b>		<b>Date</b>	20/4/11

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<b>Safety Officer</b>	R.I.Temple		
<b>Comments</b>			
<b>Signature</b>	<i>R.I.Temple</i>	<b>Date</b>	02/06/2011

### Personnel at Risk

The Health & Safety at Work Act requires that you ensure, so far as is reasonably practicable, the health and safety of yourself and others who may be affected by what you do or fail to do. Indicate using the groups listed below the individuals (restricted high-risk users) and numbers of people (e.g. with restricted user privileges or unrestricted access) who may be at risk from the hazards. Classify the *maximum* level of activity/exposure to the equipment to be permitted for each group/individual using the categories indicated below.

#### Activity/Exposure Categories

- |                                    |                               |
|------------------------------------|-------------------------------|
| 1. Reconfiguration (high exposure) | 5. Supervised reconfiguration |
| 2. Maintenance                     | 6. Supervised normal use      |
| 3. Normal use                      | 7. Supervised observation     |
| 4. Unsupervised observation        | 8. Prohibited (no exposure)   |

#### Personnel Groups

Group	Individuals/Numbers	Activity/Exposure	
<input type="checkbox"/> + <input type="checkbox"/> -	Academic Staff	All authorised CBE laboratory personnel	Normal use
<input type="checkbox"/> + <input type="checkbox"/> -	Technical Staff	All authorised CBE laboratory personnel	Normal use
<input type="checkbox"/> + <input type="checkbox"/> -	Research Staff	All authorised CBE laboratory personnel	Normal use
<input type="checkbox"/> + <input type="checkbox"/> -	Project Students	All authorised CBE laboratory personnel	Unsupervised observation
	Others		Supervised normal use



**Hazard Checklist**

Indicate below whether or not a hazard is present for *each* type listed.

**Category 1: Machinery & Work Equipment: Mechanical Hazards**

Type	Yes	No
Crushing .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Shearing .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cutting/severing .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Entanglement.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Drawing-in/Trapping.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Type	Yes	No
Impact.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Stabbing/puncture.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Friction/abrasion.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other mechanical hazard(s).....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Category 1: Machinery & Work Equipment: Electrical Hazards**

Type	Yes	No
Direct contact .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Indirect contact.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Electrostatic phenomena .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Short circuit/overload.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Type	Yes	No
Source of ignition .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Electrical test labels current.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other electrical hazard(s).....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Category 2: Workplace**

Type	Yes	No
Slips/trips/falls on a level .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Falls from a height .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Falling/moving objects/materials .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Striking objects.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Localised hot surfaces .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Type	Yes	No
Localised cold surfaces.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Storage and stacking .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Confined work area (knocks).....	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Confined space/lack of oxygen.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other workplace hazard(s).....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Category 3: Hazardous Substances**

Type	Yes	No
Toxic fluids .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Toxic gas/mist/fumes/dust.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flammable liquids .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Flammable gas/mist/fumes/dust .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High pressure gas/fluid.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
High pressure fluid injection .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Type	Yes	No
Corrosive substances .....	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Irritants/sensitising substances.....	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Oxidising substances .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Explosive substances .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Biological substances (infection).....	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Other substance hazard(s).....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Category 4: Work Activity**

Type	Yes	No
Highly repetitive actions .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Stressful posture .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Awkward/heavy lifting/handling.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Mental overload/stress.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Type	Yes	No
Visual fatigue (e.g. >3 hours VDU)...	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Poor workplace design.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Use of hand tools .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other work activity hazard(s) .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

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**Category 5: Work Organisation**

Type	Yes	No
Contractors/service.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Type	Yes	No
Other work organisation hazard(s) ....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Category 6: Work Environment**

Type	Yes	No
Significant noise.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Significant vibration.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Poor/excessive lighting .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Type	Yes	No
Hot/cold ambient temperature .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Poor ventilation .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other work environment hazard(s)....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Category 7: Other Hazard Types**

Type	Yes	No
Violence .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Stress .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Drugs.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Type	Yes	No
Substance abuse.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other hazard(s) .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Category 8: Outdoor Work**

Type	Yes	No
Outdoors on campus.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Outdoors off campus .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Overseas fieldwork.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Type	Yes	No
Site visit: construction .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Site visit: non-construction .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other hazard(s) .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Other Hazards: Radiation**

Type	Yes	No
Radiation: Lasers.....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Radiation: Electromagnetic effects ...	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Type	Yes	No
Radiation: Ionising/non-ionising .....	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other radiation hazard(s).....	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Hazard Assessment**

Describe the hazards identified above on the following pages. For each hazard assess the risk to health and safety using the risk rating formula and categories indicated below.

**Risk Calculation**

<b>Severity</b>	<b>×</b>	<b>Probability</b>	<b>=</b>	<b>Risk</b>
Major = 3 (e.g. death, major injury as per RIDDOR, irreversible health damage)		High = 3 (where certain or near certain harm will occur)		High = 6,9
Serious = 2 (e.g. injuries causing >3 days absence or reversible health damage)		Medium = 2 (where harm will frequently occur)		Medium = 2,3,4
Minor = 1 (e.g. first aid treatments and other lost time)		Low = 1 (where harm will seldom occur)		Low = 1

**Hazard Risk Rating**

Activity	Groups at risk	Hazard Description	Controls in place	Severity	Probability	Risk	Action needed? Yes No
Normal use	All authorised CBE laboratory personnel	Machinery & Work Equipment: Mechanical Hazards. All electrical equipment has long cables which can pose a trip hazard  Machinery & Work Equipment: Electrical Hazards. All electrical equipment poses a risk of electrocution to workers  Localised Hot Surfaces, incubator will be held constant at 37oC  Corrosive/Irritating substances virkon and ethanol will be used to clean work surfaces and terminate cells at end of experiment  Biological Substances - experiment will involve use of umbilical cord tissue.	All cables will be tied up behind the equipment  All electrical equipment has been PAT tested and is CE marked  Gloves will be worn at all times. Incubator will be used in accordance with SOP120 Use and Maintenance of Bench top, Compact, Thermo Scientific MaxQ™ Mini 4450 Incubator - Shaker.  PPE will be worn at all times. Virkon will be used in conjunction with SOP006 Selection and use of virkon disinfectant.  Use of tissue will be done according to approved BRA A8180651 BSC cabinets will be used for all tissue manipulations.	Minor	Low	Low	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

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**Hazard Risk Rating**

Activity	Groups at risk	Hazard Description	Controls in place	Severity	Probability	Risk	Action needed? Yes No		
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Add Row	Delete Row								



**Risk Reduction**

**Physical**

Determine whether the risk to health and safety can be reduced by modifications to the equipment or workspace, especially for those hazards identified as having medium to high risk. List planned action and completion dates below.

Hazard	Action to be taken	Responsible Personnel	Completion Date
Trips due to trailing cables	All cables will be tied back behind the equipments	Lab Manager	11.04.2011
Corrosive/Irritants/sensitising substances	Reading of COSHH Assessment form for Collagenase Type I (Record Ref no: CBE/56) Reading of COSHH Assessment form for Virkon (Record Ref no: CBE/39)	All authorised CBE laboratory persone	11.04.2011

Add Row	Delete Row
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**Procedural**

Determine and indicate below whether acceptable levels of risk to health and safety can only be achieved when equipment use must follow prescribed procedures, and/or where use must be restricted to specified personnel. Prepare and attach user guides, user restriction and other HSE documents as appropriate. Contact the Department Safety Officer for guidance/assistance as necessary.

Item	Yes	No
Does the equipment/process need an operating procedure document?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• If yes, has one been prepared and appended to this form?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Must protective equipment be worn to use the equipment/process safely? (cf. Personal Protective Equipment (PPE) regulations)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• If yes, have the users been adequately notified?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• If yes, is suitable protective equipment available for all potential users/observers?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Should the use of this equipment be restricted to certain qualified personnel?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• If yes, has a list of permitted users been prepared, appended to this form and displayed near the equipment?	<input type="checkbox"/>	<input type="checkbox"/>
Is training required to use the equipment/process safely?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• If yes, have all identified users been adequately trained?	<input type="checkbox"/>	<input type="checkbox"/>
Does the equipment have a CE mark?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• If not, does the equipment need a separate Machinery Risk Assessment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• If yes, has one been prepared and appended to this form?	<input type="checkbox"/>	<input type="checkbox"/>
If a lifting hazard has been identified is a manual handling assessment required?	<input type="checkbox"/>	<input type="checkbox"/>
• If yes, has one been prepared and appended to this form?	<input type="checkbox"/>	<input type="checkbox"/>
If hazardous substances will be in use, is a COSHH form required?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• If yes, has one been prepared and appended to this form?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Does the equipment involve the use of lasers?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
• If yes, has a laser description form been completed and appended to this form?	<input type="checkbox"/>	<input type="checkbox"/>

