Loughborough University **The Centre for Biological Engineering**	Safety Dep't' Use Only Ref No: CBE Use Only Ref No: CBE/BRA/173	Material(s) Classification Hazard Group 1 ☐ Hazard Group 2 ☒ GMO ☐ HTA Licensable ☒

FORM CBE-RA-FORM/002. Version 8.0

RISK ASSESSMENT AND PROJECT REGISTRATION FOR WORK INVOLVING BIOLOGICAL MATERIAL

PLEASE READ CAREFULLY

This form acts to register projects involving the use of Biological Agents and / or Genetically Modified Micro-Organisms, or of materials that may be contaminated with these agents. It assesses the hazards and risks associated with the project as well as identifying those at risk and the measures necessary for preventing, or controlling these risks. Please ensure that sufficient detail is provided when completing this form and that the relevant written SOPs are referenced where required. Once completed and approved, all risk assessments must be supplied to all those working within this project. The work described within this form must not commence until this risk assessment has been completed and approved and that all necessary control measures are in place.

Any changes to the work, or the persons involved, must be notified to the departmental Quality Manager (dQM). All changes requested must be recorded within the risk assessment change control form and may also need to be incorporated within an amended version of this form.

A separate risk assessment will be required for assessing risks associated with GMO activities.

Principal Investigator	
Name:	Dr. Rob Thomas
Position	Professor
Department:	Centre for Biological Engineering
School:	Wolfson School of MEME

Person conducting this risk assessment	
Name:	Jon Harriman
Position	Group Lab Technician
Department:	Centre for Biological Engineering
School:	Wolfson School of MEME

The Project Activity			
Title: West Pharmaceuticals Ltd 2019 T-Cell			
Reference No:			
Start:	15/03/2019	End:	31/12/2019

Risk Assessment Change History		
Date:	ID & Version No	Review date
05/02/2019	CBE/BRA/173 v1.0	05/02/2020

The following declaration must be completed and undersigned by the Principal Investigator or Person Responsible for the project

☒All information contained in this form is accurate and comprehensive
☒All workers involved will be instructed that their work must remain within the boundaries of this project registration & assessment
☒All workers have been given, or will be given before they become involved, adequate training and where necessary their competency assessed
☒All workers have, or will be before their involvement begins, enrolled with Occupational Health for health clearance where necessary
☒It is understood that this risk assessment shall not be transferred to a third party without the PI/Supervisor/Line Manager named in this form either taking responsibility for the new activities, or ensuring that a new proposal is submitted
☒All changes to the work covered by this form will be reassessed & the changes submitted dQM before those changes are made to the work

Name: Jon Harriman	Signature:	Date: 05/02/19

Purple = mandatory	White – for all work	Pink = cells, tissues, body fluids or excreta	Green = non-GM biological agents

1. INTRODUCTION	This section must be completed	
	1.1. Background & aim of project	The Healthcare Engineering research group, headed by Dr R. Thomas, has been contracted by West Pharmaceuticals Ltd to compare and contrast the efficacy of their West vial product for versus a standard commercially available cryovial (Nunc 1.8mL polypropylene). This risk assessment covers the work to be done by Loughborough University. This is comprised of the isolation of CD2+/CD28+ T-cells from a delivery of mixed peripheral blood mononuclear cells, the cell culture and cryopreservation of the cell yield and the thawing of vials via a standard water bath method.
	1.2. Description of experimental procedures	Primary Peripheral Blood Mononulclear Cells (PBMCs) will be ordered from Cambridge Bioscience, Cambridge, U.K. and transported into H27 following CBE/SOP/008 "Receipt of Hazardous Biological Material", CBE/SOP/005 "Storage and Transport of Biological Agents", HTA-PR-SOP004 "Receipt and Storage of HTA Material" and HTA-PR-SOP006 "Acquisition and Transfer of HTA Material". The units will be processed on receipt using standard T-flask / well plate cell culture. A 1E7 portion of PBMCs will me immediately cryopreserved. The remaining PBMCs will be cultured for six days maximum to achieve a minimum of 1E7 total viable CD2+/CD28+ T-cells. 1E7 PBMCs will be cryopreserved as 10x 1mL 1E6 vials (5x West, 5x Nunc) using two Asymptote Via Freeze Research (VFR) Controlled Rate Freezer (CRF) machines. The remaining PBMCs will be cultured for 6 days under standard cell culture conditions in order to selectively isolate CD2+/CD28+ T-cells. The T-Cells will then be cyro-preserved in 5x West, 5x Nunc vials at 1E6/mL after six days of growth. A fraction of the expanded T-Cells will be cultured for a further six days as a non-frozen control. The cells will be held in cyro-storage for at least one week and then thawed using a standard water bath protocol. There will be a six day period of outgrowth post-cryo for cells from both vial types.
	1.3. Where will this work be carried out?	**Rooms/areas: CBE H27, H21, H34** **Building(s): Centre for Biological Engineering, Garendon Wing** **Campus: Holywell Park, Loughborough**
	NOTE: A brief background to the project provides the reviewer a better understanding of the aims of the work. For Q1.2, the author is encouraged to cover as much of their activities with a particular material or biological agent as possible within this form. Describe laboratory procedures to be used and highlight any non-standard laboratory operations (these may need cross reference to supporting documentation i.e. protocols).	

2. NATURE OF WORK & HAZARD IDENTIFICATION	If this material is to be used then all relevant parts of this section must be completed			
	TISSUES, CELLS, BODY FLUIDS OR EXCRETA			
	2.1. If human or animal tissues, cells, body fluids or excreta will NOT be used then hatch here ☐ and proceed to section 2.11.			
	2.2. List all cells, tissues, body fluid or excreta to be used. For cells indicate whether primary, continuous or finite.			
	Material type	**Organ source**	**Species**	**Where will it be obtained from (*include country of origin*)**
	1. PBMCs (Primary)	Peripheral blood	Human	Cambridge Bioscience, Cambridge, U.K.
	2.			
	3.			
	4.			
	5.			
	2.3. Is any material listed in section 2.2 considered to be 'relevant material' under the Human Tissue Act 2004?* *If No, proceed to section 2.4*			☒Yes ☐No
	2.3.1. List all HTA relevant material and indicate the source/provider *(please tick all appropriate boxes)*			

Relevant Material type	Source/Provider *A=Commercial supplier;* *B=HTA licensed Biobank with REC approval for generic research use; C=Other HTA licensed organisation;* *D=Organisation with REC approval for research use;* *E=Imported*	
1. PBMCs (Primary)	☒ A ☐ B ☐ C ☐ D ☐ E	Cambridge Bioscience, Cambridge, U.K.
2.	☐ A ☐ B ☐ C ☐ D ☐ E	
3.	☐ A ☐ B ☐ C ☐ D ☐ E	
4.	☐ A ☐ B ☐ C ☐ D ☐ E	
5.	☐ A ☐ B ☐ C ☐ D ☐ E	

* See https://www.hta.gov.uk/policies/list-materials-considered-be-%E2%80%98relevant-material%E2%80%99-under-human-tissue-act-2004#sthash.EliTXrB3.dpuf

2.4. Has any material listed in section 2.2 been genetically modified in any way? *If Yes, complete GMO Risk Assessment Form & provide Reference*	☐Yes ☒No	Ref No:
2.5 Has any of the material listed in section 2.2 been identified in the list of cross-contaminated/ misidentified cell lines? Check HPA website (http://www.hpacultures.org.uk/media/E50/3B/Cell_Line_Cross_Contaminations_v6_0.pdf *If Yes, provide details of the route of provenance back to the originator of the cell line, together with a Certificate of Analysis; identifying the methods used to qualify the cell type.*	☐Yes ☒No ☐N/R	
2.6. Has any of the material listed in section 2.2 been screened for infectious/communicable disease agents eg HIV, HBV, HCV, TSEs, HTLV etc. *If Yes, provide details.*	☒Yes ☐No	PBMCs purchased from Cambridge Bioscience are screened for: • HIV I/II, Hep B & Hep C, Syphilis
2.7. Will any clinical history or veterinary screening be provided?	☒Yes ☐No ☐N/R	
2.7.1. If Yes, detail what this will include:	Blood group, Age, Gender, Ethnicity, Blood count indices.	
2.7.2. If Yes, will a policy of rejection of samples from diseased donors be adopted? Explain:	Only healthy donors between ages 18-60. Donors fill out a pre-screening questionnaire and can be rejected based on health. Donors are 24h alchohol free via breathalyser.	
2.7.3. If Yes, and for human material, how will the information be disseminated in the course of the project?	Filed QA paperwork only	☐N/R
2.7.4. If Yes and for human material, will this information be anonymised?	☒Yes ☐No	☐N/R
2.8. What is the likelihood of infection of any of this material? Consider the worst case if multiple materials are to be used.	☐Medium Risk ☐High Risk Go to Q2.9	☒Low Risk ☐None Go to Q3.1
2.9. If medium or high risk of infection - name and classify the biological agents this material could be infected with	**Material type:** **Agent:** **ACDP/Defra Classification:**	
2.10. Describe the type and severity of the disease that can be caused to humans or animals by each of the agents that could be present.	PBMCs purchased from Cambridge Bioscience are screened for: • HIV I/II, Hep B & Hep C, Syphilis Only healthy donors are selected to provide material via pre-screening questionnaire. Cells will be treated as potentially infectious at all times. However the chances of a lab user being infected with any agent if at all present remain extremely low when proper lab procedures are followed.	

BIOLOGICAL AGENTS (i.e. micro-organisms such as bacteria, viruses, fungi, microscopic endoparasites)

2.11. If non-Genetically Modified biological agent will NOT be used then hatch here ☒ and proceed to section 3.1

2.12. List the biological agents to be used	Name of agent	Strain(s)	ACDP/Defra classification

	2.13. Describe the type & severity of the disease that can be caused to humans, animals or plants by each of the agents and if relevant, the particular strains in use *e.g. colonisation, infection, allergy, toxin-mediated disease*			
	2.14. Has any strain listed in section 2.12 been genetically modified in any way? *If Yes, complete the GMO Risk Assessment form*	☐Yes ☐No	Ref No:	

1. DECLARATION	**This section must be completed in all cases**	
	CLASSIFICATION OF HAZARD GROUP	
	3.1. Are you confident that any non-GM organism, tissue, cell, body fluid, excreta or any component thereof covered by this assessment cannot potentially pose a threat to humans or cause human diseases?	☐ Yes* - Classify as HG1 ☒ No
	3.1.1. If No, can any non-GM organism, tissue, cell, body fluid, excreta or any component thereof cause human disease and potentially be a hazard to humans but is unlikely to spread to the community and for which there is usually effective prophylaxis or treatment available?	☒ Yes - Classify as HG2 ☐ No
	3.1.2. If No, can any non-GM organism, tissue, cell, body fluid, excreta or any component thereof cause severe human disease and potentially be a serious hazard to humans and that may spread to the community, where effective prophylaxis or treatment may or may not be available?	☐ Yes – **DO NOT USE** Consult the DSO
	3.2. Do any of the materials contain pathogens or toxins covered by the Anti-Terrorism Crime and Security Act?	☒No ☐Yes – **DO NOT USE** Consult the DSO
	***NOTE: PLEASE READ CAREFULLY** *You must only answer 'YES' to question 3.1 if you believe that you have sufficient information to be confident that the material(s) covered by this risk assessment would be of no or of negligible risk to human health even in the event of a total breach of containment all the biological agents.*	
	ASSIGNMENT OF CONTAINMENT LEVEL	**CL2**
	PLEASE READ CAREFULLY *The laboratory Containment Level is directly related to each of the 4 Hazard Groups; organisms categorised as HG1 (lowest hazard rating) should normally be handled in CL1 facilities (minimum level of containment), and likewise HG2 in CL2 facilities.* ***All projects using HG1 and/or HG2 biological material(s) will be carried out under Containment level 2*** *(CL2) within the CL2 CBE Tissue Engineering Laboratory Unit or within the CL2 CBE Laboratory Unit at Holywell for reasons supplementary to worker protection; this includes the need to ensure research material protection/integrity (e.g. the use of a Class II safety cabinet) and to impose a quality assurance discipline.*	

2. NATURE OF THE WORK	All relevant parts of this section must be completed			
	TISSUES, CELLS, BODY FLUIDS OR EXCRETA			
	4.1. If human or animal tissues, cells, body fluids or excreta will NOT be used then hatch here ☐ and proceed to Q4.8			
	4.2. Will any culturing of the material described in section 2 take place? *If Yes, describe which cell(s) will be cultured and under what conditions.*	☒Yes ☐No	PBMCs will be cultured for a period of 6 days pre-cryo in order to achieve a total cell yield of 1E7 T-cells or above. Non-cryopreserved T-Cells will be cultured for a further 6 days. Both the isolated yield of T-cells and non-cultured cryopreserved PBMCs will be cultured for a period of 6 days after cryopreservation to determine outgrowth potential post thaw. All storage and processing of PBMCs and their isolates will be recorded and tracked via Procuro and its generated unique ID numbers.		
	4.3. If culturing, could HIV permissive cells be present*? *If Yes, describe the cells and for how long these cultures will be allowed to grow.*	☒Yes ☐No	As the peripheral blood source material is screened for HIV, there is only a low risk that it may be present in culture. All material will be handled within a class 2 BSC under GLP and is treated as potentially infectious at all times.	
	4.4. If culturing, what is the maximum volume of culture	**Per vessel: 35mL**	**Number of vessels: 3**	☐

	grown?			N/R
	4.5. Will the tissues, cells, body fluids or excreta be manipulated in any way that could result in the concentration of adventitious biological agent present? *If Yes, explain.*	☒Yes ☐No	Any HIV infected T cells that may potentially be present (if any) within the peripheral blood and isolates will be positively selected for during culture in CD2+/CD28+ T-Cell adapted growth medium. All material will be handled within a class 2 BSC under GLP and is treated as potentially infectious at all times.	
	4.6. Will any of the tissues, cells or fluids be donated by you or your colleagues working in or with access to the labs?	Yes☐ No☒		
	4.6.1. If Yes, detail who will provide these			☒ N/R
	4.6.2. If Yes, detail how the materials will be used and the special risks involved*			☒ N/R
	4.6.3. If Yes, provide justification for not using material from another safer source e.g. National Blood Service			☒ N/R
	4.6.4. If Yes, how will confidentiality be assured?			☒ N/R
	4.6.5. If Yes, has written consent been obtained from the donor?			☒ N/R
	4.6.6. If Yes, has Ethics Committee approval been obtained?	Yes☐ No☐		
	***NOTE 1:** If unsure seek advice. Refer to CBE Code of Practice for details on additional precautions.*			
	****NOTE 2:** Workers **MUST NEVER** culture, deliberately transform or modify their own cells or cells from their co-workers or workers otherwise associated with the experimental work. This presents a particular hazard since any self-inoculation injury could have potentially serious consequences as cells would essentially circumvent the normal protection of the immune system.*			

	BIOLOGICAL AGENTS (i.e. micro-organisms such as bacteria, viruses, fungi, microscopic endoparasites)			
	If non-Genetically Modified biological agent will NOT be used then hatch here ☒and proceed to section 5.			
	4.8. Describe ALL route(s) of infection (relevant to the laboratory setting) and the minimum infectious dose(s), if known	**Name of agent**	**Route(s)**	**Minimum infectious dose**
	4.9. What is the highest concentration and volume of agent(s) to be worked with?	**Per experiment:**	**Total stored:**	
	4.10. Are there any known drug resistances amongst the strains to be used? *If Yes, explain what these are and the consequences*			
	4.11. What forms of agent will be used e.g. spores, vegetative forms and are there any issues over the robustness of these particular forms e.g. resistance to disinfectants or increased stability on dry surfaces?			
	4.12. What will be the most hazardous procedure involving the use of this material?			

3. RISKS AND CONTROL MEASURES

All questions in this section must be answered and further details supplied when indicated

Risk		**If Yes, how will this be controlled?**	**Reference to SOPs/ other documentation**
5.1. Might infectious droplets, aerosols or splashes be created, either deliberately or by accident?	☒ Yes ☐ No	All manipulations of the material will be conducted in a class 2 biological safety cabinet and the user will be wearing full appropriate PPE at all times within the laboratory.	CBE/SOP/009 CBE/SOP/037
5.2. Will this material be transported within the laboratory e.g. between BSC & incubator?	☒ Yes ☐ No	Material cultured within a biological safety cabinet in H27 will need to be transported by hand to an incubator within H27. Material in culture will not be transported out of H27. Sample material will need to be transported to H34 and H21 in small volumes (<5ml) for -80C storage or analysis. All transportation of material outside of a BSC will be conducted within closed containers e.g. tissue	CBE/SOP/005 CBE/SOP/009

			culture flasks, centrifuge tubes, eppendorf tubes.	
	5.3. Will this material (including waste) be transported locally between sites on campus but outside the laboratory?	☐ Yes ☒ No	*Detail the containment measures which will be used to prevent or contain accidental splashes or spills.*	
	5.4. Will material(s) listed in sections 2.2 or section 2.3 be shipped to organisations elsewhere in the UK or abroad? *Refer to WHO guidance for transport of infectious substances: http://apps.who.int/iris/bitstream/10665/149288/1/WHO_HSE_GCR_2015.2_eng.pdf?ua=1	☐ Yes ☒ No	*Provide details of material(s) to be shipped.(include secondary hazardous substances eg dry ice)* *Provide details of mode of transport eg road, rail, air, sea, postal.* **Provide details of the packaging. If material is classified under the dangerous goods regulation, it must be packaged and labelled in compliance with its UN classification and associated packing instruction.*	**Provide reference to relevant Packing Instruction*
	5.5. Will this material be received from organisations elsewhere in the UK or abroad?	☒ Yes ☐ No	The material will be shipped as fresh peripheral blood mononuclear cell units at ambient temperature from a well-established provider, Cambridge Bioscience, Cambridge, U.K. from donors within the U.K. Upon receipt of material, lab users will follow CBE/SOP/008 "Receipt of Hazardous Biological Material". This SOP is intended to minimise the consequences that could result from any failure of packaging or materials used in shipping. Before any HTA licensable material is received a HTA PR Form 007 Acquisition & Receipt of Biological Material will be completed and filed with the laboratory manager.	CBE/SOP/008 "Receipt of Hazardous Biological Material" FS008.1: HTA-PR-FORM/007
	5.6. Will this material be stored?	☒ Yes ☐ No	Primary material may be stored for the short term (up to 24 hours) in a HTA designated secondary container in the laboratory cold room (H17) under chilled 2-8°C conditions dependent on shipment date and time of receipt (CBE/SOP/027). Cryopreserved expanded cells will be stored long term in liquid nitrogen vapour phase within vials in a HTA designated box within Cryobank 7 Rack 5 in H31. Cryobanks are maintained twice weekly by trained laboratory personnel to ensure continuity of proper storage conditions (CBE/SOP/013). Samples of used culture medium may be stored long term at -80°C in Eppendorf tubes within a secondary container, within a shared laboratory ULT freezer in H34 (CBE/SOP/049).	CBE/SOP/027 "Use and Maintenance of the CBE Cold Room" CBE/SOP/013 "Use and Maintenance of Liquid Nitrogen Stores" CBE/SOP/049 "Use and Maintenance of the -80 Freezer"
	5.7. Will infectious material be centrifuged?	☒ Yes ☐ No	Centrifuging takes place as part of the culture of PBMCs and T-cells and the formulation of vial cell density at 300g for 5 minutes. Harvested cells are centrifuged within closed centrifuge tubes with a maximum volume of 50ml per tube in an open bucket capable of holding 4 tubes. Material is only handled in open containers within a BSC. Any small (<10ml) spillages occurring within the centrifuge will be dealt with by wiping with absorbent tissue soaked with 1:50 chemgene disinfectant and placed in the yellow stream waste. Larger scale spillages (max 200ml, 4x 50ml tubes) can be dealt with using a spill kit provided in every lab space. Users of the centrifuge will wear all appropriate PPE at all times within the laboratory. Lab users will adhere to CBE/SOP/134 "Use and maintenance of Sigma 3-15 Centrifuge" at all times.	CBE/SOP/134 "Use and Maintenance of Sigma 3-15 centrifuge"
	5.8. Are biological samples to be cultured in an incubator?	☒ Yes ☐ No	All material will be cultured within the top (A) shared 37°C, 5% CO2 static incubator in H27. The incubator containing HTA relevant material will be labelled on the outside. Material will not be transported into any other incubator inside or outside of H27. Small scale spillages (<10ml) can be dealt with by wiping with absorbent tissue soaked in 1:50 chemgene disinfectant. Large scale spillages will be dealt with using a provided spill kit followed	CBE/SOP/110 "Use and Maintenance of the of the Sanyo MCO-19M and Panasonic MCO—170MUVH-PE Multigas

			by a full clean using 70% IMS and a H2O2 decontamination program built into both incubators. Shared incubators are not to be over filled. Lab users will adhere to CBE/SOP/110 "Use and maintenance of SANYO MCO-19M and Panasonic MCO-170MUVH-PE Muligas Incubators" and CBE/SOP/038 "Biological spill response" at all times while using the laboratory incubators.	Incubators" CBE/SOP/038 "Biological spill response"
	5.9. Are sharps to be used at any stage during this activity?	☒ Yes ☐ No	West vials are sealed with a rubber stopper and a crimped metal collar. Content extraction is done via a needle and syringe. The use of sharps with isolates from unscreened primary human material forms the greatest risk factor of this project. As such great care must be taken when handling the commercially available needle in the presence of PBMCs and T-cells. All primary material and isolates will be treated as potentially infectious at all times. The use of needles will be avoided wherever possible. The BD Precisionglide needles comes within plastic and paper packaging on the outside while the needle itself is inside a hard plastic sheath. Once the sheath is removed and the needle has been used, the needle must be placed in an autoclavable sharps bin inside the BSC immediately. **Users must not attempt to re-sheath the needle or place the needle anywhere other than the sharps bin.** Nitrile gloves and a lab coat will be worn at all times within the lab as standard however no other PPE (such as extra gloves) is required as aseptic technique must be maintained while working with cell culture. Users must maintain GLP at all times and be responsible for their own safety and the safety of other lab users when handling sharps during this project. **Any and all accidents or near misses involving sharps and needles MUST be reported immediately by all lab users.**	CBE Code of Practice
	5.10. Are animals to be used in this project? *(If Yes, describe procedures involved, if shedding is possible and additional precautions or training required)*	☐ Yes ☒ No	Procedures: *Describe what procedures will be undertaken (e.g. inoculation of animals, harvest of tissues), who will perform the work and where.* Shedding: *Confirm if shedding of viable biological agent is possible (eg at site of inoculation, in faeces or urine) If Yes, detail the routes of shedding, risk periods and additional precautions to control exposure.* Additional Precautions: *Provide details on any other additional precautions necessary and any additional training required for those handling animals.*	
	5.11. Will a fermenter/bioreactor be used to culture a biological agent or material?	☐ Yes ☒ No	*Confirm the size, type and location of the bioreactor. Describe any supplementary containment measures required (e.g., the use of a BSC or spill tray).*	
	5.12. Is there any stage within the experimental procedures when an infectious material is inactivated (other than for disposal)?	☐ Yes ☒ No	*Describe how will this be done and what will then happen to the material*	
	5.13. Is there any of the following to be used in conjunction with this project? *If Yes, provide details*	☒ Yes ☐ No	☒Liquid nitrogen ☐Ionising radiation ☒Carcinogens/mutagens ☐Toxins ☒Lone working	LN2 and storage of cyro-preserved samples. Risk assessment reviewed. Reagents used for cryopreservation

				e.g. DMSO COSHH assessments completed. Out of hours lone working risk assessment completed.
	5.1.4. Are there any conditions associated with the hazards described in section 5.13 that require additional control measures?	☐ Yes ☒ No	*Describe the control measures required to prevent hazards e.g. avoiding incompatibilities with disinfectants (e.g. Virkon) or hazardous product decomposition associated with high temperatures e.g. autoclaving*	

4. PPE AND HYGEINE

All questions in this section must be answered

Control measure	Details	Reference to SOPs/ other documentation
6.1 When will gloves be worn?	At all times when inside the laboratory.	CBE/SOP/037 CBE/SOP/004
6.2 What type and where will they be stored?	Nitrile. First change, second change rooms.	
6.3 When will laboratory coats be worn and what type are these?	At all times when inside the laboratory. White Howie.	
6.4 Where will lab coats be stored and what are the arrangements for cleaning or disposal?	First change room. Autoclaved and dry cleaned monthly in rotation. Severe contamination leads to immeditate autoclaving and a new labcoat being dispensed to user.	
6.5 Is any other type of PPE to be used? If Yes, provide details	Safety spectacles.	
6.6 Describe the lab hygiene facilities available and where they are located	Lab areas cleaned weekly. Equipment stored in first change store cupboard.	

5. WASTE

All questions in this section must be answered

a. How will waste be treated prior to disposal

(Note that all differently treated wastes must be included e.g. if some liquid is autoclaved, but others not, then describe both)	Treatment prior to disposal	Is the treatment validated?	Reference to SOPs/ other documentation
Liquid waste	Liquid waste is autoclaved on cycle 6 within a bucket. Autoclaved liquid waste is then disposed down the lab sink followed by copious volumes of water. Any remaining autoclaved solids are placed in the orange waste stream. Liquid waste that is non-autoclavable and non-cytotoxic (e.g. small volumes) is treated with Virkon tablets (1 tab per 200ml) for 24 hours before disposal down the lab sink follow by copious volumes of water. Liquid waste contaminated with cytotoxic chemicals e.g. Trypan blue will be disposed of by collecting in a glass winchester bottle and labeling with a non-halogenated chemical waste form and placed in gas pod 1 for collection and disposal at a specialist site. A HTA-PR-012 Authorisation for Disposal form will be completed and filed for HTA licensable material that is disposed of via aspiration to Virkon or autoclaved as liquid waste as per HTA-PR-SOP007 "Disposal of HTA Material".	☒Yes ☒No	CBE/SOP/004 "General Laboratory Housekeeping" CBE/SOP/006 "Selection and Use of Virkon Disinfectant" CBE/COSHH/039 "Virkon" CBE/SOP/003 "Disposal of Biological Waste" CBE/SOP/039 "Storage, Handling and Disposal of Chemicals" HTA-PR-FORM/012 HTA-PR-SOP007 "Disposal of HTA Material".

Solid waste	Solid waste that has been in contact with biological material is placed in autoclavable bags next to each BSC and loosely tied when medium full. The filled bags are autoclaved at the earliest opportunity on cycle 4 and then placed in a secondary orange labeled bio-hazard bag and sealed with a zip tie labeled with the appropriate codes (180103, 180202). Solid waste that has not been in contact with biological material e.g. packaging or that has been in contact with chemicals rendering it non-autoclavable will be placed in an ordinary bin and tied when medium full. The filled bags are placed within a secondary yellow biohazard bag and closed with a zip tie labeled with the appropriate codes (180103, 180202, 180106, 180205). Solid waste that is contaminated with cytotoxic chemicals is placed in a cytotoxic waste bag and sealed with a zip tie labeled with the appropriate codes (180103, 180108, 180202, 180207) and placed in gas pod 2 for collection and disposal at a specialist site.	☒Yes ☐No	CBE/SOP/004 "General Laboratory Housekeeping" CBE/SOP/003 "Disposal of Biological Waste" CBE/SOP/039 "Storage, Handling and Disposal of Chemicals"
Other (specify)	Sharps waste will be placed within an orange autoclavable sharps bin. Once filled to the indicated line the sharps bine is fully closed an wrapped with autoclave tape to indicated whether it has been sterilised. The sharps in is placed into a secondary container until it can be autoclaved on cycle 4. Once autoclaved the sharps bin is placed in a secondary container in the autoclave room waste cage until it is emptied into the wheelie bin in gas pod 2.	☒Yes ☐No	CBE/SOP/004 "General Laboratory Housekeeping" CBE/SOP/003 "Disposal of Biological Waste" CBE Code of Practice

b. If waste is to be autoclaved confirm the following:

All cycles have been validated for the actual load types used?	Yes ☒ No ☐	*If Yes, documentary evidence of the validation must be available*	CBE/SOP/003
The successful completion of every load is checked prior to disposal?	Yes ☒ No ☐		CBE/SOP/003

c. How will liquid waste be disposed of?

To drain?	Yes ☒ No ☐	CBE/SOP/006
As solid waste?	Yes ☐ No ☐	
Other (specify)?	Yes ☒ No ☐	CBE/SOP/003

d. How will solid waste be disposed of?

Categorisation	**Waste stream: Colour Code**	**Disposal method**
☒ Sharps	Orange	Yellow/Orange lidded sharps bin > autoclave sterilisation if known or potentially infected > clinical waste disposal (incineration)
☒ Sharps contaminated with cytotoxic or cytostatic material	Purple	Yellow/Purple lidded Sharps bin >clinical waste disposal (incineration @ 1000C)
☒ Human body parts, organs, including blood bags and blood preserves and excreta that have been pre-treated before leaving the site	Orange	Disinfection or sterilisation in the lab site > Yellow/Orange lidded rigid one way sealed tissue bins > clinical waste disposal (incineration)

			#Human tissue waste must be placed in separate containers from non-human waste and labelled 'HTA waste'
	☐ Animal body carcasses or recognisable parts that have been pre-treated before leaving the site	Orange	Disinfection or sterilisation in the lab site > Yellow/Orange lidded rigid one way sealed tissue bins > clinical waste disposal (incineration
	☒ Potentially or known infected lab wastes contaminated or potentially contaminated with cytotoxic or cytostatic material that have NOT been pre-treated before leaving the site	Purple	Yellow/Purple clinical waste bags > clinical waste disposal (incineration)
	☒ Potentially or known infected lab wastes that have NOT been pre-treated before leaving the site	Yellow	Yellow clinical waste bags > clinical waste disposal (incineration)
	☒ Infected or potentially infected lab wastes that have been pre-treated before leaving site	Orange	Disinfection or sterilisation in the lab site > orange clinical waste bags > clinical waste disposal (incineration)

6. MAINTENANCE

All questions in this section must be answered

a. Are preventative maintenance and monitoring regimes in place for the following laboratory equipment?
If Yes, detail frequency

		Inspection, servicing	Cleaning/ disinfection	Monitoring/ Alarms	Reference to SOPs	N/R
Centrifuges	☒Yes ☐No	Inspected by lab users weekly. Annual PAT.	Cleaned weekly	Integrated balancing monitor and alarm.	CBE/SOP/122	☐
BSCs	☒Yes ☐No	PER and DFV values inspected before each use. Serviced and tested annually. Annual PAT	Small clean before and after each use. Full clean weekly.	Integrated air flow monitor and alarm.	CBE/SOP/009	☐
Autoclaves	☒Yes ☐No	Serviced annually. Pressure inspection annually.	Surrounding area cleaned weekly.	Integrated temperature, pressure and water supply monitor and alarm.	CBE/SOP/024	☐
Incubators	☒Yes ☐No	Inspected weekly. Annual PAT	Full H2O2 decontamination every 2 months. Pan cleaned every 2 weeks.	Integrated monitor and alarm for temperature and gas supply.	CBE/SOP/110	☐
LN2 Stores	☒Yes ☐No	Cryobanks inspected and maintained twice weekly. LN2 stocks refreshed weekly.	Surrounding area cleaned weekly.	Low oxygen alarm placed nearby.	CBE/SOP/013	☐
Freezers	☒Yes ☐No	Annual PAT	Defrosted and cleaned twice anually.	Temperature monitor linked to outside alarm.	CBE/SOP/016	☐
Fridges	☒Yes ☐No	Annual PAT	Cleared and cleaned twice anually.	Temperature monitor linked to outside alarm.	CBE/SOP/016	☐
Others (specify) Fume hood	☒Yes ☐No	Annual PAT	Cleaned weekly	Integrated air flow monitor.	CBE/SOP/026	☐

7. T

All questions in this section must be answered

9:1. Have all project research workers under taken safety training for working with hazardous or potentially hazardous biological materials and agents at CL2?

Name of researcher		Date training completed or will be completed	If No ,please state why
Jon Harriman	☒Yes ☐No	30/06/14	
	☐Yes ☐No		
	☐Yes ☐No		
	☐Yes ☐No		
	☐Yes ☐No		

9.2. If work involves HTA 'Relevant Material', confirm that all project research workers have undertaken HTA training ☐N/R

Name of researcher		Date HTA training completed or will be completed			If No ,please state why
		Induction	On-line	In-house	
Jon Harriman	☒Yes ☐No	26/10/16, 23/10/18	3/10/16	09/11/16, 24/10/18	
	☐Yes ☐No				
	☐Yes ☐No				
	☐Yes ☐No				
	☐Yes ☐No				

8. EMERGENCY PROCEDURES

All questions in this section must be answered

a. Are procedures in place for dealing with spillage of infectious or potentially infectious material

Equipment		Reference to SOPs	N/R
Within the BSC	☒Yes☐No	CBE/SOP/038 "Biological Spill Response", CBE/SOP/004 "General Laboratory Housekeeping", CBE/SOP/009 "Use and Maintenance of a Herasafe KS class II BSC"	☐
Within the centrifuge	☒Yes☐No	CBE/SOP/038 "Biological Spill Response", CBE/SOP/004 "General Laboratory Housekeeping", CBE/SOP/134 "User and maintenance of Sigma 3-15 Centrifuge"	☐
Within the laboratory but outside any primary control measure e.g. BSC	☒Yes☐No	CBE/SOP/038 "Biological Spill Response", CBE/SOP/004 "General Laboratory Housekeeping"	☐
Outside the laboratory	☒Yes☐No	CBE/SOP/008 "Receipt of Hazardous Biological Material", CBE/SOP/005 "Storage and Transport of Biological Material"	☐

b. Describe the procedures in place for an accidental exposure		Reference to SOPs
Immediate action	Immediately seek medical attention, inform BGMSA / DSO and follow exposure section of CBE/SOP/038 "Biological Spill Response". Consult the MSDS of any chemical agent involved. Any spillage, loss, accidental exposure or near-miss events involving HTA licensable material must be reported to the dPD, dQM immediately for CAPA investigation as per HTA-MI-SOP008 "Reporting Adverse Events".	CBE/SOP/038 "Biological Spill Response" HTA-MI-SOP008 "Reporting Adverse Events".
When and whom to report the incident	As soon as possible after any necessary in lab response / first aid inform BGMSA / DSO / dPD/ dQM..	CBE/SOP/050 "Corrective and Preventative Action (CAPA) Procedure" HTA-MI-SOP008 "Reporting Adverse Events".

9. ACC

All questions in this section must be answered

		Reference/SOP
11.1. Is the lab(s) adequately separated from other areas (e.g. offices)?	☒Yes ☐No	CBE area map

	If No, explain		
	11.2. Is the lab(s) or other work areas shared with other users not involved in the project? *If Yes, explain who and what procedures are in place to control any risk to them.*	☒Yes ☐No This work will be conducted within H27 and H34 within the CBE containment level 2 laboratories. Access is restricted to trained personnel signed off by the laboratory management and maintenance workers with a specific permit to work in accordance with local code of practice and quality management systems. There is no access to the laboratory by any cleaning or general maintenance staff. The laboratory is locked outside of core work hours (0800 - 1800).	CBE/SOP/086 "Training and Competancy Assessment" Lab users training files: H27 users. CBE/LW/076 "West Pharmaceuticals 2019"
	11.3. Describe the measures in place to ensure that hazardous biological agents or material is secure	Access is restricted to trained personnel signed off by the laboratory management and maintenance workers with a specific permit to work in accordance with local code of practice and quality management systems. There is no access to the laboratory by any cleaning or general maintenance staff. The laboratory is locked outside of core work hours (0800 - 1800). Permitted personnel are issued with electronic key cards and a key to the labs and have an approved out of hours lone working risk assessment. Cyrobanks are locked with padlocks, the required key must be signed out by a user and their actions logged.	CBE/SOP/086 "Training and Competancy Assessment"

10. OCCUPATIONAL HEALTH	**All questions in this section must be answered**	
	12.1. All workers involved with handling unscreened blood, blood products and other tissues are recommended to have Hepatitis B immunisation. Have all workers involved in this project been immunized?	☒Yes ☐No
	12.2. Is health surveillance required?	☐Yes ☒No

11. NOTIFICATIONS	**All questions in this section must be answered**		
	13.1. Are any of the cells, tissues or fluids covered by the Human Tissue Act (HTA) under the University HTA Licence?	☒Yes ☐No	*If Yes, provide Licence No.* 12577
	13.2. Are any of the cells, tissues or fluids obtained from a HTA licensed biobank with REC approval for generic research use?	☐Yes ☒No	*If Yes, provide details (including dates) and reference to evidence of approval.*
	13.3. Does this work have ethical approval from a recognised NHS Research Ethics Committee?	☐Yes ☒No	*If Yes, provide details (including dates) and reference to evidence of approval*
	13.4. Does any of the work require approval from the University Ethical Committee?	☐Yes ☒No	*If Yes, provide details (including dates) and reference to evidence of approval.*
	13.5. Do any of the materials require approval for use from the UK Stem Cell Bank Steering Committee (MRC)? *(e.g. embryonic stem cells sourced from UK sources but not available through the UK Stem Cell Bank)*	☐Yes ☒No	*If Yes, provide details (including dates) and reference to evidence of approval.*
	13.6. Do any of the materials or biological agents listed require any other licenses? *(e.g. HSE notification under COSSH; Home Office notification under anti-terrorism, crime and security act; Defra/SAPO license for import of animal products and pathogens etc.*	☐Yes ☒No	*If Yes, provide details (including dates) and reference to evidence of approval.*

14. APPROVALS

All relevant approvals must be completed before work is started

For work involving HG1 biological agents or materials: Review and approval is required by the departmental Quality Manager or an authorised, designated member of CBE staff before the work begins. A signed copy of this form must be sent to the University Safety Office. NOTE: Explicit approval will also be required from the Departmental Biological Safety Advisor and the University Biological Safety Officer before work begins, if you answered 'Yes' to Q13.5.

For work with HG2 biological agents or materials: Explicit approval is required from the Departmental Biological Safety Advisor and the University Biological Safety Officer (or deputy) before work begins.

For all work involving HTA 'Relevant Material': If you answered 'Yes' to Q13.1, explicit approval will also be required from the departmental Person Designate.

If the biological agent has been Genetically Modified this form, (approved by the relevant authority, as above) should be submitted with the GMO risk assessment to the Departmental Biological Safety Advisor and both forms forwarded to the LU GM Safety Committee for final approval.

NAME:	SIGNATURE:	DATE:
1. Departmental Quality Manager or other authorised personnel *(please indicate position)*:		
2. Departmental Person Designate *(as applicable)*:		
3. Departmental Biological Safety Advisor:	R A Temple	11/03/2019
4. University Biological Safety Officer (or Deputy):	A Turner	21/03/2019