

CHECKLIST FOR RESEARCH ON STEM CELL AND CELL-BASED THERAPIES

Phase/Process	Key requirements	Researcher (Please tick \/)	Secretariat MREC (Please tick \/)
1. Pre-clinical studies (investigators must show their own data and not from other laboratories)	<ul style="list-style-type: none"> Approval letter from animal ethics committee is recommended 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Accreditation of animal research facility in institution requiring GLP compliance 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Evidence that the pre-clinical studies was subjected to rigorous and independent peer review and regulatory oversight 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Safety data in small animals 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Safety data in large animals 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Comprehensive toxicology data in small animals (including contamination, acute infusional toxicity, deleterious immune responses, unexpected behavior of the cellular product, and tumorigenesis) 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Comprehensive toxicology data in large animals (including risks of contamination, acute infusional toxicity, deleterious immune responses, unexpected behavior of the cellular product, and tumorigenesis) 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Proof of principle of the desired effect (that the cells have repaired the damage/disease) – unequivocal efficacy data 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Show biological distribution data 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Show evidence of physiologic integration and long-lived tissue reconstitution 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Show that differentiation (either <i>in vitro</i> before transplantation or <i>in vivo</i> after transplantation) occur only along the desired lineages 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Design based on clinical expectations 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Mechanistic studies to show biology (done by the group) 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> GLP compliant 	<input type="checkbox"/>	<input type="checkbox"/>

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	<ul style="list-style-type: none"> Evidence that the pre-clinical data has been submitted to the NPCB 	<input type="checkbox"/>	<input type="checkbox"/>
2. Phase I trials	<ul style="list-style-type: none"> Comprehensive pre-clinical studies have been done and data showed safety and efficacy in animals (performed by the group) is recommended 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Procedures on how the cells be tracked in terms of homing to the target area, viability and longevity of the cells 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Procedures on how the safety be monitored 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Procedures to assess risks of tumorigenicity by an independent body must be implemented 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Procedures to assess short, medium and long term side effects 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> GCP compliance 	<input type="checkbox"/>	<input type="checkbox"/>
3. Phase II trials	<ul style="list-style-type: none"> Data from Phase I trials (performed by the group themselves and if the trial is not performed by the group, explain why the data should be used for this trial) 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Procedures on how the cells be tracked in terms of homing to the target area and viability of the cells 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Optimisation of dose, route, regimen, patient population, endpoints, and controlled 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Procedures on how the safety be monitored 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Independent data safety monitoring board 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Plan to assess short, medium and long term side effects 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> GCP compliance 	<input type="checkbox"/>	<input type="checkbox"/>

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4. Phase III trials	<ul style="list-style-type: none"> Data from Phase II trials (performed by the group themselves) 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Design to show safety and efficacy 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Independent data safety monitoring board 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> GCP compliance 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Conduct 'randomised' control 	<input type="checkbox"/>	<input type="checkbox"/>
5. Cell processing and manufacturing	<ul style="list-style-type: none"> Evidence by a letter of conformance for GMP compliance and issued by relevant authority 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Show evidence of relevant processes: Standard operating procedures, quality standards, environmental control, equipment qualification, analytical methods, audits, staff training, etc. 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Cell processing and manufacture of any product must be conducted under scrupulous, expert, and independent review 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Demonstrate that the product is safe, pure and potent 	<input type="checkbox"/>	<input type="checkbox"/>
6. Product registration	<ul style="list-style-type: none"> Show that the product has been registered with the National Pharmaceutical Control Bureau before use in human trials 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> License for clinical trial has been obtained 	<input type="checkbox"/>	<input type="checkbox"/>
7. Cell characterization (pre-requisite to clinical trials)	<ul style="list-style-type: none"> History of the cells in the stem cell or cell-based product 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Biological characterisation of cell type 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Demonstration of purity 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Demonstration of potency (e.g. cells produce insulin in a physiological manner) 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Manufacturing standards and independent certification, where relevant 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Evidence that cells are free from contamination 	<input type="checkbox"/>	<input type="checkbox"/>

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	<ul style="list-style-type: none"> Evidence of viability and longevity of cells after transplantation (to determine the likely duration of the therapeutic effect) 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Evidence that cells will home into the area of damage or repair 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Evidence of genomic stability during culture 	<input type="checkbox"/>	<input type="checkbox"/>
8. Investigators and researchers	<ul style="list-style-type: none"> Is the Principal Investigator trained in cell transplantation? (Show evidence of credentialing) 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Are other investigators trained in cell transplantation? (Show evidence of credentialing) 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Qualifications of scientists and researchers 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Registration with National Medical Research Register, Ministry of Health (MOH) 	<input type="checkbox"/>	<input type="checkbox"/>
9. Centres performing therapy (Information for patients)	<ul style="list-style-type: none"> Registration with PHCFSA Act, Ministry of Health 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Informing subjects about the human embryonic cell source, if applicable 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> The unique risks; and disclose honestly that the treatment have not been tried before 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Utmost clarity on the potential benefit 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Disclosing financial and non-financial conflicts of interest 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Provide monitoring patients long term 	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> Providing a clear, timely, and effective plan for adverse event reporting 	<input type="checkbox"/>	<input type="checkbox"/>