

• 系統編號	RC9911-2210		
• 計畫中文名稱	心肌內自體骨髓衍生間質幹細胞移植在急性心肌梗塞後的迷你豬於磁共振造影之灌流,功能及磷-31 磁共振頻譜中能量代謝之變化		
• 計畫英文名稱	Intramyocardial Autologous Bone Marrow-Derived Mesenchymal Stem Cell Transplantation in Acute Myocardial Infarction: Effect on Mr Perfusion and Left Ventricular Function, and Energetic Changes on Phosphorus-31 MR Spectroscopy in a Mini-Pig Model		
• 主管機關	行政院國家科學委員會	• 計畫編號	NSC97-2314-B182A-099-MY3
• 執行機構	財團法人長庚紀念醫院放射診斷科		
• 本期期間	9708 ~ 9807		
• 報告頁數	0 頁	• 使用語言	中文
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• 中文關鍵字	--		
• 英文關鍵字	--		
• 中文摘要	<p>在這 3 年期實驗研究之第一年，我們成功由迷你豬身上抽取之骨髓培養出單細胞性幹細胞(BMDMSC)及成功建立在迷你豬動物模式進行急性心肌梗塞(acute myocardial infarction,AMI)之磁共振造影研究，由 6 隻健康迷你豬之身上，對於左心室(LV)進行功能評估，由心臟磁共振造影可知 LV 心臟舒張末期容積(EDV)為 45-50ml，心縮末期容積(ESV)為 16-17ml，心輸出容積為 30-36ml 及心噴出百分比(EF)為 65-70%，左心室質重為 50-55g 及 LV 質重/體重之比例為 2.8-3。對於實驗組 1 (無 BMDMSC 治療)及實驗組 2 (有 BMDMSC 治療)之迷你豬，在左下降冠狀動脈被結紮後第 3 天之平均 LV EDV，ESV，SV，EF，LV 質重及 LV 質重/體重比例各為 48.5ml，27.1ml，21.3ml，43.9%，48.2g，2.6g/kg 及 47.6ml，27ml，20.7ml，43.3ml，47.2g，2.6g/kg。與健康迷你豬比較，這些數據有下降但二實驗組類似。組 1 及組 2 之血流灌流下降比例及栓塞/LV 質重比為 38.9% vs 35.5% 及 17.6 vs 17，二組亦類似。對於組 1 之迷你豬，在 90 天之追蹤，LV 功能惡化，而平均 LV EDC，ESV，SV，EF，LV 質重及 LV 質重/體重為 56.8ml，43ml，13.9ml，24.5%，36.7g，2.2g/kg。血流灌流下降比及栓塞/LV 質重比為 36.5% 及 19.5。另一方面，經 BMDMSC 治療，組 2 在 90 天追蹤；LV 功能卻有改善，平均 LV EDV，ESV，SV，EF，LV 質重及栓塞/LV 質重比為 49.1ml，24.9ml，24.2ml，49.2%，49.1g，2.7g/kg。血流灌流下降比及栓塞/LV 質重比亦改善至 19.1% and 10.4。初步觀察，BMDMSC 治療可降低急性心肌梗塞及保存 LV 之功能，而心臟磁共振造影是追蹤治療效果很有用之方法。對於磷-31 磁共振頻譜(P-31 MRS)，6 健康迷你豬之 PCr 及 <math>\gamma</math>-ATP 為 69-93 及 30-40 虛擬單位，而 PCr/<math>\gamma</math>-ATP 比例為 1.5-2.6(平均 2.1)。與實驗組 1 及組 2 比較，雖然其頻譜尖峰下面積在手術前看來較高些，但 PCr/<math>\gamma</math>-ATP 之比例在術前及術後 3 天相差不大。由初步觀察，比較 PCr/<math>\gamma</math>-ATP 比例似乎用處不大，需要量化 PCr 及 ATP，似乎才可應用 P-31 MRS 作為 BMDMSC 治療之評估，本研究計劃之成員正積極尋找方法，以無機磷假體進行量化 PCr 及 ATP 之可行性，但在此初步報告未能下任何結論。</p>		
• 英文摘要	<p>During the first year of this 3-year experimental study, we have accomplished the setting-up of a swine model for cardiac MR imaging acute myocardial infarction in mini-pig and effect of bone marrow-derived mononuclear stem cells (BMDMSC). Preliminary data about left ventricular (LV) function in 6 healthy mini-pigs (16-20kg) were acquired including LV end-diastolic volume (EDV) 45-50ml; end-systolic volume (ESV) 15-17ml, stroke volume (SV) 30-36ml, ejection fraction (EF) 65-70%, LV mass 50-55g and LV mass/body weight ratio 2.8-3 respectively. The mean values of LV EDV, ESV, SV, EF, LV mass and LV/body weight, % of hypoperfused area on first passed contrast enhanced MRI and infarct size/LV mass ratio in group 1 (without BMDMSC treatment) and group 2 (with BMDMSC treatment) mini-pigs at day-3 after LAD ligation were 48.5ml, 27.1ml, 21.3ml, 43.9ml, 48.2g, 2.6g/kg, 38.9% and 17.6; and 47.6ml, 27ml, 20.7ml, 43.3ml, 47.2g, 2.6g/kg, 35.5% and 17 respectively. Compare with control, the data are of mild decrement but such values are similar between two groups. At day-90, the data in group and group 2 were 56.8ml, 43ml, 13.9ml, 24.5%, 36.7g, 2.2g/kg, 36.5% and 19.5; and 49.1ml, 24.9ml, 24.2ml, 49.2%, 49.1g, 2.7g/kg, 19.1 and 10.4, respectively. Group 1 demonstrated LV function deterioration and BMDMSC treatment seems of great potential in alleviating myocardial infarction for group 2. For P-31 MRS in 6 healthy mini-pigs, PCr and <math>\gamma</math>-ATP were approximately 65-93 and 30-40 A.U., respectively while the PCr/<math>\gamma</math>-ATP ratio was 1.5-2.6 (mean 2.1). Although PCr and ATP values were seemingly greater in normal control, the PCr/ATP ratios between group 1 and group 2 were similar. Therefore, it might be hard to assess the effect of LAD ligation based solely on PCr/ATP ratio and quantifications of PCr and ATP seem inevitable and our research group is now working on developing a semi-quantification method but more complicate work has to be done before any conclusion can be made.</p>		