

**Table 1: Values for relative gene expression values for the studied genes of HBM-MSCs by the three studied protocols (donor# 1)**

	Undifferentiated MSCs		One-Step		Two-Step		Three-Step		Human Islets
<b>INS</b>	Undetected	Undetected	0.00352	0.00354	0.008609	0.006801	0.001724	0.001642	1
<b>GCG</b>	0.00072	0.00066	0.00427	0.00630	0.010525	0.009099	0.003988	0.003217	1
<b>PDX1</b>	0.00061	0.00065	0.00290	0.00175	0.002743	0.002355	0.003262	0.002705	1
<b>SST</b>	0.00024	0.00021	0.00251	0.00229	0.002388	0.002323	0.005263	0.003906	1
<b>NGN3</b>	0.00045	0.00000	0.00729	0.00787	0.00194	0.001289	0.005563	0.010453	1
<b>PAX4</b>	0.00016	0.00015	0.00148	0.00430	0.00072	0.000569	0.001874	0.001381	1
<b>GCK</b>	0.00370	0.00357	0.00694	0.01584	0.005119	0.004979	0.001228	0.001099	1
<b>RFX6</b>	0.00246	0.00278	0.01305	0.01871	0.007599	0.010097	0.006434	0.007599	1
<b>GLUT2</b>	0.00058	0.00047	0.00306	0.00962	0.003721	0.003799	0.002388	0.002137	1
<b>Neurod1</b>	0.00035	0.00039	0.03280	0.04904	0.11908	0.119908	0.035403	0.021344	1
<b>NES</b>	0.00319	0.00261	0.02149	0.02936	0.018453	0.017948	0.00734	0.006661	1
<b>MafA</b>	0.00239	0.00249	0.00989	0.01128	0.003377	0.004876	0.007759	0.003496	1
<b>MafB</b>	0.00704	0.00609	0.01031	0.01418	0.007041	0.007041	0.200267	0.205898	1
<b>OCT4</b>	0.00043	0.00042	0.00526	0.00996	0.000899	0.000918	0.002507	0.002472	1

**Table 2: Values for relative gene expression values for the studied genes of HBM-MSCs by the three studied protocols (donor # 2)**

	Undifferentiated MSCs		One-Step		Two-Step		Three-Step		Human Islets
<b>INS</b>	Undetected	Undetected	0.005119	0.006848	0.00271	0.00328	0.006708	0.005839	1
<b>GCG</b>	0.000662	0.00075	0.001575	0.001677	0.00267	0.00267	0.008609	0.004334	1
<b>PDX1</b>	0.000745	0.000905	0.001186	0.000937	0.00229	0.00160	0.004158	0.003773	1
<b>SST</b>	0.002291	0.003354	0.002455	0.004187	0.00132	0.00436	0.007546	0.006661	1
<b>NGN3</b>	0.004809	0.005486	0.002275	0.003065	0.00189	0.00254	0.013602	0.011359	1
<b>PAX4</b>	0.000549	0.000772	0.000386	0.000386	0.00040	0.00072	0.002542	0.002631	1
<b>GCK</b>	0.000103	9.12E-05	0.000269	0.00016	0.00065	0.00064	0.001511	0.00141	1
<b>RFX6</b>	0.005524	0.006215	0.001069	0.002152	0.00218	0.00286	0.004072	0.004187	1
<b>GLUT2</b>	0.000394	0.000557	0.001298	0.0014	0.00302	0.00413	0.003961	0.003472	1

<b>Neurod1</b>	0.007759	0.00613	0.008032	0.008912	0.01278	0.04972	0.021197	0.020193	1
<b>NES</b>	0.004876	0.002182	0.006302	0.005263	0.01468	0.02336	0.009486	0.008609	1
<b>MafA</b>	0.000459	0.000681	0.00113	0.001586	0.00313	0.00385	0.005226	0.010097	1
<b>MafB</b>	0.001631	0.001501	0.007867	0.007442	0.00249	0.00340	0.009037	0.007867	1
<b>OCT4</b>	0.000316	0.000229	0.000343	0.00044	0.00071	0.00112	0.002388	0.001913	1

**Table 3: Values for relative gene expression values for the studied genes of HBM-MSCs by the three studied protocols (donor # 3)**

	Undifferentiated MSCs		One-Step		Two-Step		Three-Step		Human Islets
<b>INS</b>	Undetected	Undetected	0.00530	0.00498	0.00568	0.00523	0.002093	0.002899	1
<b>GCG</b>	0.00003	0.00003	0.00662	0.01252	0.00734	0.00916	0.004581	0.005048	1
<b>PDX1</b>	0.00001	0.00001	0.00523	0.00626	0.00744	0.01192	0.002613	0.003044	1
<b>SST</b>	0.01184	0.01305	0.00820	0.00916	0.00803	0.00891	0.006661	0.006992	1
<b>NGN3</b>	0.01782	0.01951	0.00600	0.00798	0.01698	0.01618	0.007239	0.008851	1
<b>PAX4</b>	0.00803	0.00949	0.00170	0.00180	0.00227	0.00439	0.00198	0.002613	1
<b>GCK</b>	0.00015	0.00022	0.00622	0.00699	0.00155	0.00407	0.001298	0.0017	1
<b>RFX6</b>	0.04389	0.05329	0.026461	0.084788	0.01024	0.03955	0.003906	0.004776	1
<b>GLUT2</b>	0.00362	0.00362	0.00290	0.00302	0.00465	0.00494	0.004809	0.003879	1
<b>Neurod1</b>	0.05403	0.06381	0.04870	0.02664	0.03443	0.02486	0.071298	0.019104	1
<b>NES</b>	0.00220	0.00204	0.00512	0.00719	0.00744	0.00549	0.275476	0.325335	1
<b>MafA</b>	0.00126	0.00129	0.01017	0.00837	0.00910	0.00765	0.005263	0.006346	1
<b>MafB</b>	0.00635	0.00729	0.00110	0.00091	0.00244	0.00212	0.156041	0.154963	1
<b>OCT4</b>	0.00046	0.00043	0.00160	0.00319	0.00357	0.00328	0.002137	0.002323	1

**Table (4): Values for In vitro human insulin release (ng/ $\mu$ g protein/hour) among cells from all donors in the three protocols**

Glucose conc.				
Protocol	5.5 mM	12 mM	25 mM	P-Value
<b>One Step:</b>				
<b>Donor 1</b>	0.005	0.009	0.018	
	0.003	0.007	0.015	
	0.003	0.008	0.017	
	0.004	0.009	0.019	
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<b>Donor 2</b>	0.004	0.01	0.016	
	0.007	0.012	0.018	
	0.006	0.011	0.019	
	0.007	0.013	0.02	
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<b>Donor 3</b>	0.004	0.009	0.015	
	0.003	0.008	0.012	
	0.006	0.01	0.02	
	0.004	0.008	0.017	
<b>Mean <math>\pm</math> S.D</b>	<b>0.005 <math>\pm</math> 0.001</b>	<b>0.009 <math>\pm</math> 0.002</b>	<b>0.017 <math>\pm</math> 0.002</b>	<b>&lt; 0.05</b>

<b>Two Step:</b>				
<b>Donor 1</b>	0.007	0.01	0.02	
	0.005	0.008	0.019	
	0.008	0.012	0.024	
	0.005	0.009	0.02	
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<b>Donor 2</b>	0.007	0.013	0.024	
	0.008	0.015	0.026	
	0.005	0.012	0.019	
	0.007	0.014	0.021	
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<b>Donor 3</b>	0.003	0.009	0.01	
	0.005	0.01	0.016	
	0.007	0.012	0.02	
	0.004	0.01	0.02	
<b>Mean ± S.D</b>	<b>0.006 ± 0.002</b>	<b>0.011 ± 0.002</b>	<b>0.019 ± 0.004</b>	<b>&lt; 0.05</b>

<b>Three Step:</b>				
<b>Donor 1</b>	0.003	0.005	0.014	
	0.005	0.008	0.017	
	0.002	0.004	0.012	
	0.003	0.006	0.013	
<b>Donor 2</b>	-----	-----	-----	
	0.006	0.013	0.019	
	0.009	0.015	0.022	
	0.005	0.011	0.018	
<b>Donor 3</b>	0.007	0.013	0.02	
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	0.008	0.014	0.023	
	0.006	0.012	0.019	
<b>Mean ± S.D</b>	0.009	0.016	0.025	
	0.008	0.015	0.023	
	<b>0.006 ± 0.002</b>	<b>0.011 ± 0.004</b>	<b>0.019 ± 0.004</b>	<b>&lt; 0.05</b>
<b>P-Value</b>	<b>0.23</b>	<b>0.02</b>	<b>0.05</b>	

**Table (5): Values for In vitro human c-peptide release (ng/μg protein/hour) among cells from all donors in the three protocols**

Glucose conc.	5.5 mM	12 mM	25 mM	P-Value
Protocol				

<b>One Step:</b>				
<b>Donor 1</b>	0.007	0.015	0.02	
	0.006	0.012	0.018	
	0.005	0.013	0.017	
	0.006	0.016	0.022	
<b>Donor 2</b>	-----	-----	-----	
	0.006	0.011	0.018	
	0.009	0.02	0.027	
	0.008	0.018	0.023	
<b>Donor 3</b>	0.009	0.02	0.028	
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	0.006	0.012	0.02	
	0.005	0.01	0.018	
<b>Mean ± S.D</b>	0.008	0.017	0.025	
	0.005	0.011	0.02	
	<b>0.007 ± 0.001</b>	<b>0.015 ± 0.004</b>	<b>0.021 ± 0.004</b>	<b>&lt; 0.05</b>

<b>Two Step:</b>				
<b>Donor 1</b>	0.009	0.018	0.023	
	0.007	0.015	0.02	
	0.01	0.02	0.028	
	0.006	0.013	0.019	
<b>Donor 2</b>	0.009	0.018	0.023	
	0.01	0.02	0.027	
	0.007	0.015	0.021	
	0.008	0.019	0.024	
<b>Donor 3</b>	0.005	0.01	0.018	
	0.007	0.017	0.022	
	0.008	0.019	0.023	
	0.006	0.01	0.019	
<b>Mean ± S.D</b>	<b>0.008 ± 0.002</b>	<b>0.019 ± 0.004</b>	<b>0.022 ± 0.003</b>	<b>&lt; 0.05</b>

<b>Three Step:</b>				
<b>Donor 1</b>	0.005	0.012	0.018	
	0.007	0.014	0.02	
	0.004	0.011	0.016	
	0.005	0.013	0.018	
<b>Donor 2</b>	-----	-----	-----	
	0.009	0.02	0.026	
	0.01	0.022	0.03	
	0.007	0.016	0.021	
<b>Donor 3</b>	0.009	0.02	0.029	
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	0.01	0.023	0.03	
	0.008	0.017	0.024	
<b>Mean ± S.D</b>	0.012	0.024	0.032	
	0.011	0.023	0.03	
<b>Mean ± S.D</b>	<b>0.008 ± 0.003</b>	<b>0.018 ± 0.005</b>	<b>0.024 ± 0.006</b>	<b>&lt; 0.05</b>
<b>P-Value</b>	<b>0.39</b>	<b>0.32</b>	<b>0.33</b>	