

# **Tissue-specific Differentiation Potency of Mesenchymal Stromal Cells from Perinatal Tissues**

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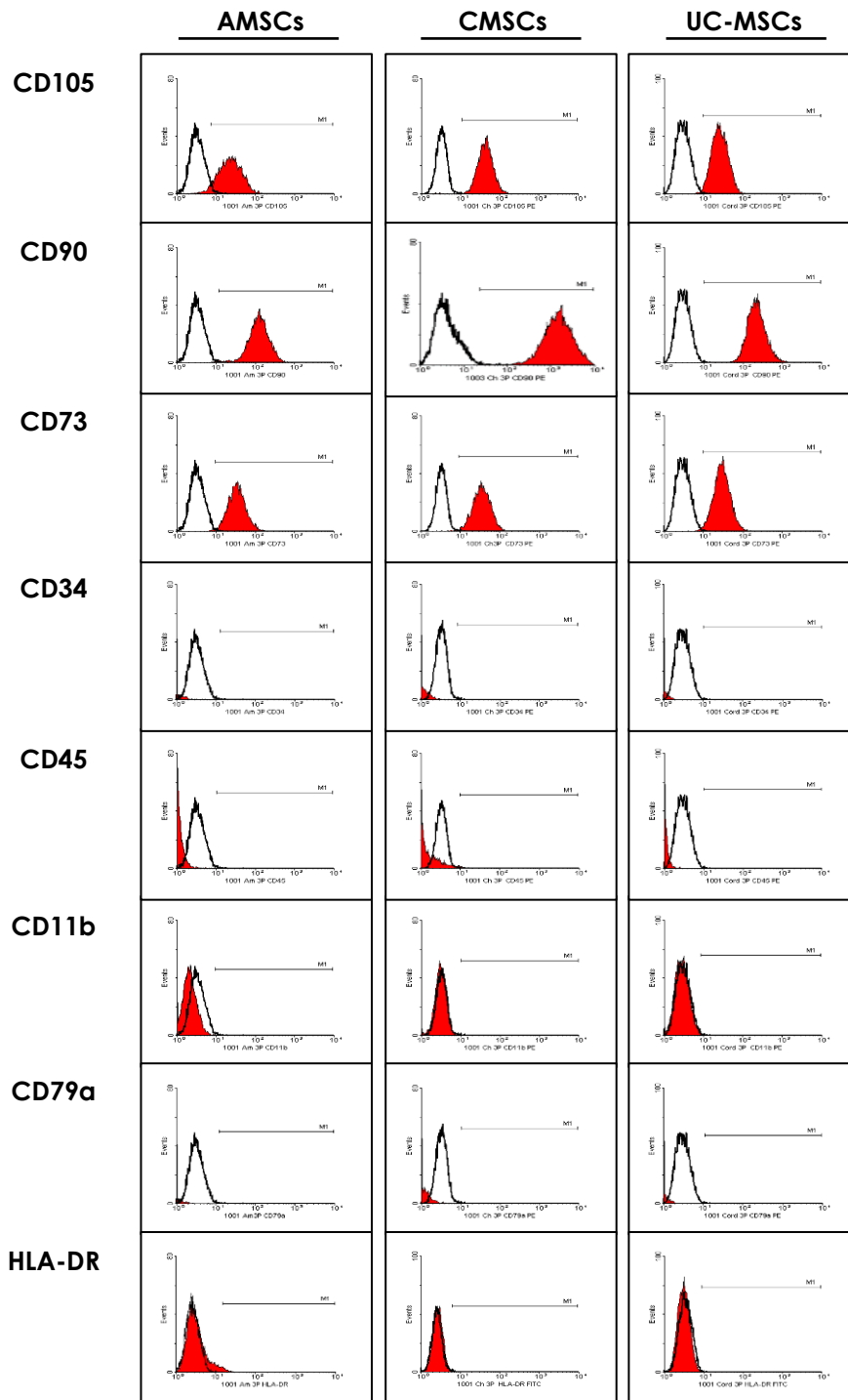
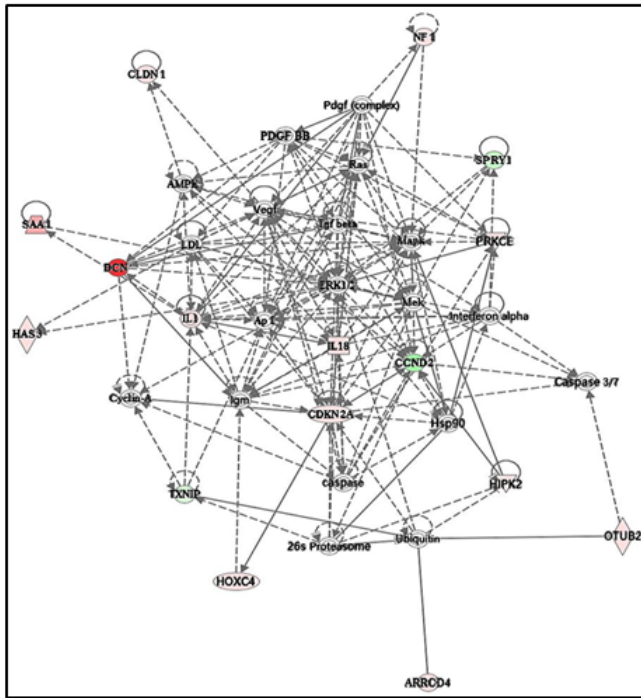


Figure S1. Immunophenotypic expression of amniotic mesenchymal stromal cells (AMSCs), chorionic MSCs (CMSCs) and umbilical cord MSCs (UC-MSCs). Representative flow cytometry histograms showing mesenchymal surface marker expression profile of AMSCs, CMSCs, and UC-MSCs. Red histograms represent antibody staining and black histograms indicate isotype matched IgG controls.

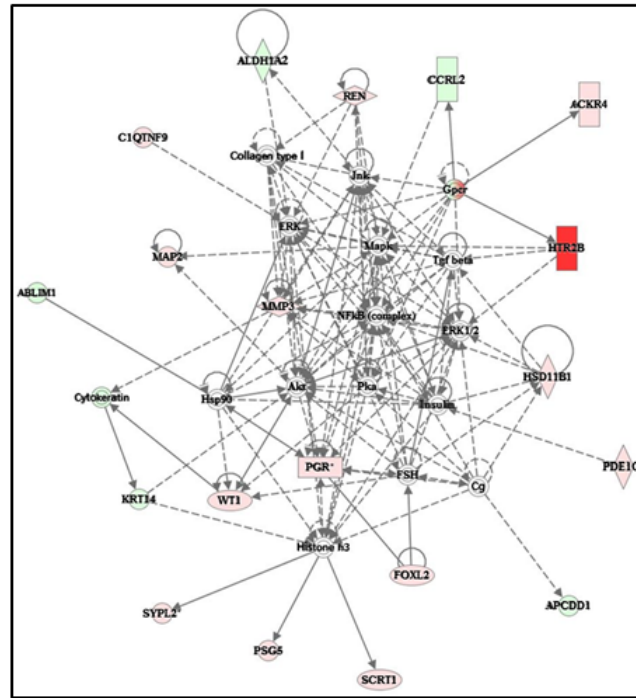
(A)

MSCs	IPA Network Functions	Functions annotation	P value	Molecules
AMSCs	Cellular Growth and Proliferation	proliferation of cells	0.00020	AK4, CCND2, CDKN2A, CLDN1, DCN, GPX3, HAS3, HIPK2, HOXB5, IL18, MEG3, NF1, PCK2, PRKCE, RAPH1, SAA1, SPRY1, STAT4, TXNIP
		expansion of cells	0.00316	CCND2, HOXB5, IL18, STAT4
CMSCs	Cardiovascular System Development and Function	development of cardiovascular system	0.01440	ALDH1A2,ESAM,HOXD3,HTR2B,MMP3,SIX1,WT1
		abnormal morphology of cardiovascular system	0.00046	ALDH1A2,HOXD3,HTR2B,REN,SLC4A1,SLCO2A1,WT1
		morphogenesis of cardiovascular system	0.01520	ALDH1A2,HTR2B,SIX1
		abnormal morphology of heart	0.00142	ALDH1A2,HTR2B,SLC4A1,SLCO2A1,WT1
		growth of heart	0.00130	ALDH1A2,HTR2B,WT1
		permeability of vasculature	0.00195	ESAM,MMP3
		abnormal morphology of artery	0.00308	HOXD3,REN,WT1
		pressure of artery	0.00001	HSD11B1,HTR2B,REN
	Hematological System Development and Function	abnormal morphology of heart ventricle	0.00506	HTR2B,SLC4A1,SLCO2A1
		quantity of macrophages	0.00670	HSD11B1,MMP3,REN
		homeostasis of blood	0.00781	REN,SLC4A1
		arrest in growth of hematopoietic progenitor cells	0.01230	WT1
		function of T lymphocytes	0.01700	ACKR4,CCRL2,MMP3
		osmolality of blood	0.02280	SLC4A1
UC-MSCs	Nervous System Development and Function	neurotransmission	0.00021	AMPH,BCHE,KALRN,KCNMA1,NPY,SLC1A3
		innervation	0.00217	CDH6,KCNMA1,NTRK3
		coordination	0.00075	CPE,KALRN,KCNMA1,NTRK3
		circadian rhythm	0.02080	DPYD,KCNMA1
		chemically-elicited antinociception	0.03560	GNAZ
		abnormal morphology of vertebrae	0.02610	HOXC10,MDFI
		function of neurons	0.01650	KALRN,KCNMA1
		quantity of neurons	0.01190	KALRN,NPY,NTRK3,SLC1A3
		memory	0.00156	KALRN,NPY,NTRK3,SORL1
		abnormal morphology of neurons	0.00797	KALRN,NTRK3,SLC1A3,SORL1
		differentiation of mechanosensory neurons	0.00114	KCNMA1,NTRK3
		quantity of neuronal progenitor cells	0.02720	NPY
	quantity of sensory neurons	0.00778	NTRK3,SLC1A3	
	Behavior	learning	0.00020	AMPH,BCHE,KALRN,NPY,NTRK3,SORL1
		conditioning	0.00067	AMPH,KALRN,KCNMA1,NPY
		behavior	0.00155	AMPH,BCHE,CPE,KALRN,KCNMA1,NPY,NTRK3,SORL1
		walking	0.00376	CEND1,KCNMA1
		anxiolysis	0.00687	NPY
locomotion		0.03350	BCHE,CEND1,KCNMA1	

**(B) Cellular Growth and Proliferation in AMSCs**



**(C) Cardiovascular System Development and Function in CMSCs**



**(D) Nervous System Development and Function in UC-MSCs**

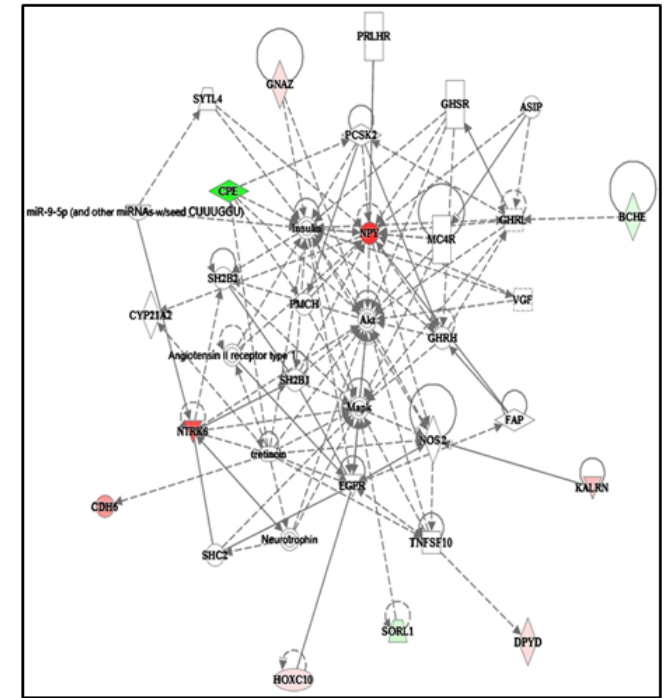


Figure S2. Network analysis. (A) Top networks identified with Ingenuity pathway analysis and representing schematic relationships among key genes changed in (B) amniotic mesenchymal stromal cells (AMSCs), (C) chorionic MSCs (CMSCs) and (D) umbilical cord MSCs (UC-MSCs). The pink or red color nodes in networks indicate a gene that is up regulated and the pale and deep green color nodes do a gene that is down regulate.

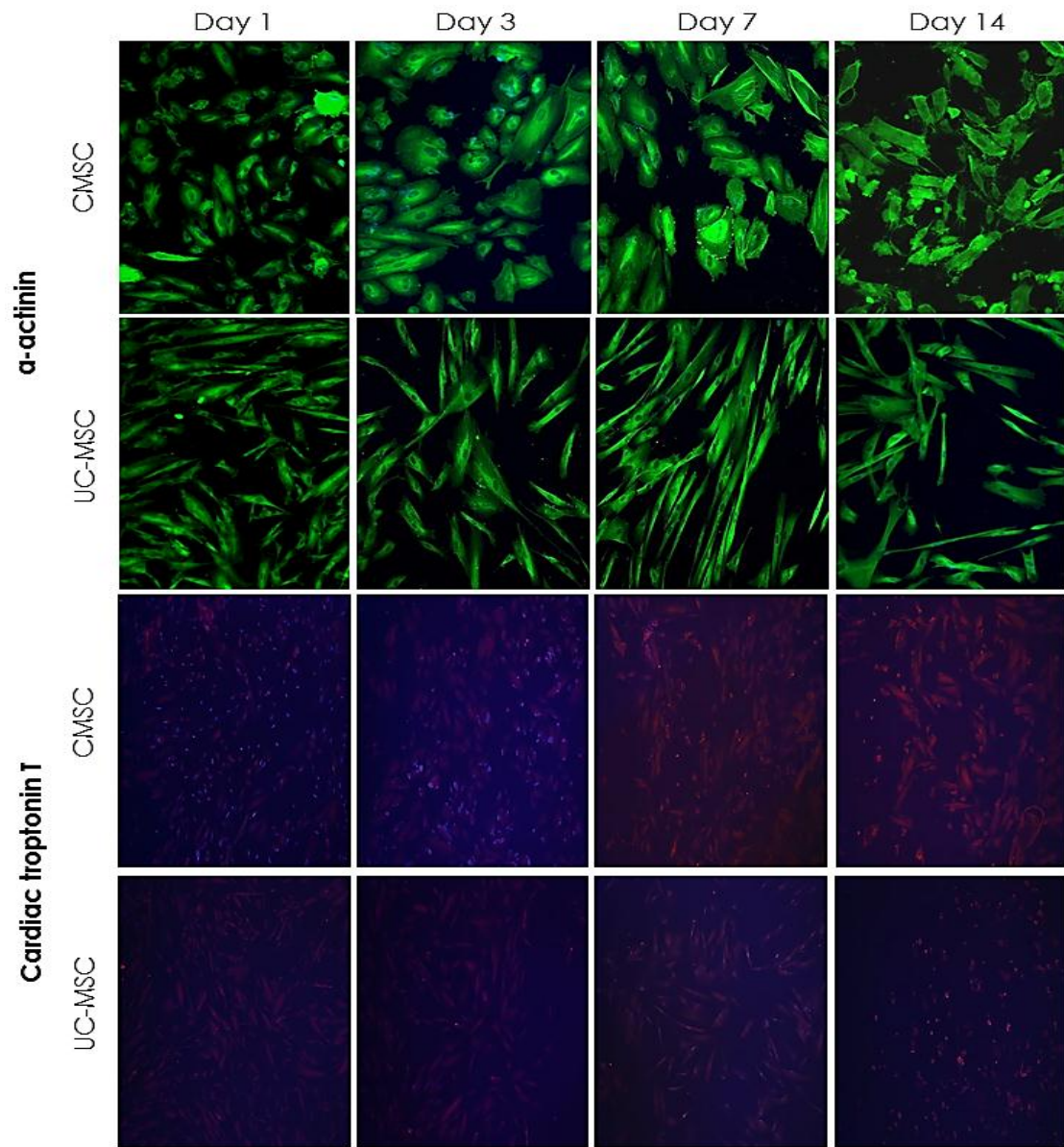


Figure S3. Monitoring the cardiac differentiation of mesenchymal stromal cells (MSCs) from chorion (CMSCs) and umbilical cord (UC-MSCs) by (A) immunofluorescent staining of alpha actinin (green) and cardiac troponin T (red) (x50) at day 1, 3, 7 and 14.

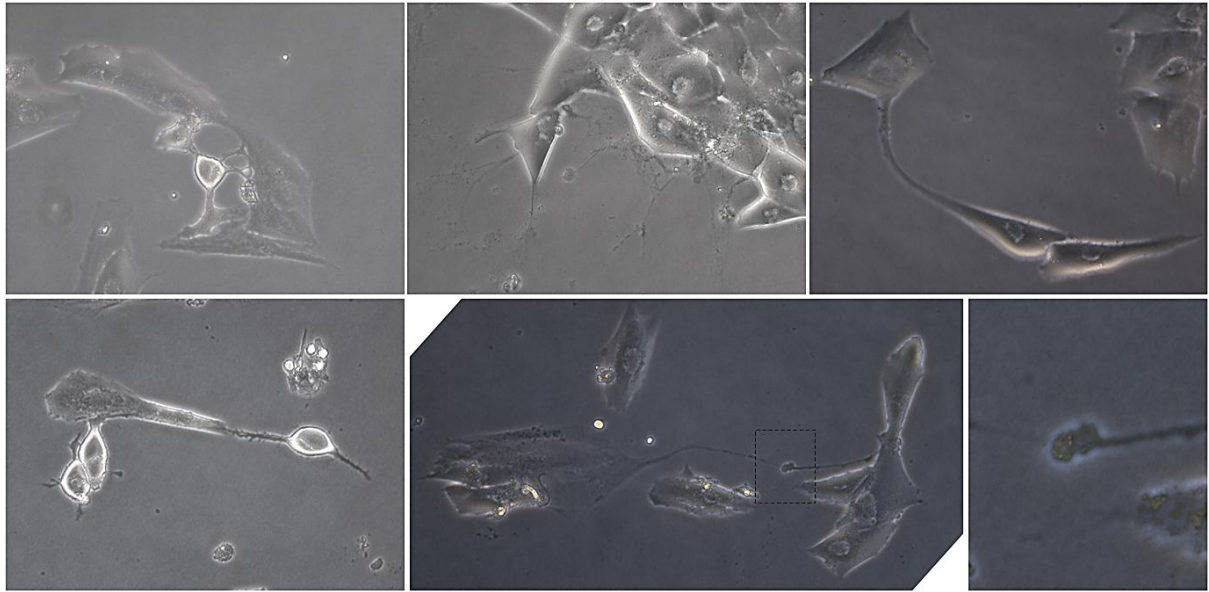


Figure S4. Neuron-like cells with retraction of cell body and long axon-like process after differentiation induction. High magnification phase-contrast view. Note the connected long processes with terminal bulbs (dotted box) ( X 100).