Supplemental Materials

Supplemental Tables and Legend

Antibody name	Vendor	Catalog number	Dilution	Application
mouse anit α-sarcomeric actin	Sigma-Aldrich	A7611	1:400	ICC/IHC
rabbit anit α-sarcomeric actin	Abcam	ab52219	1:400	ICC/IHC
rabbit anti-Ki67	Abcam	ab46154	1:400	ICC/IHC
chicken anti-CD105	Sigma-Aldrich	GW22756	1:400	ICC/IHC
mouse anti-human nuclear antigen	Millipore	Mab1281	1:400	ICC/IHC
rabbit anti-CD90	Abcam	ab92574	1:400	ICC/IHC
rabbit anti-vimentin	Abcam	ab92547	1:400	ICC/IHC
rat anti-procollagen	Abcam	ab64409	1:400	ICC/IHC
mouse anti-CD117 (APC)	BD	550412	1:10	Flow
mouse anti-CD105 (PE)	R & D Systems	FAB10971P	1:5	Flow
mouse anti-CD90 (FITC)	BD	555595	1:5	Flow
mouse anti-CD45 (FITC)	BD	555482	1:5	Flow

Table S1. Detailed antibody information.

Patient ID	CD90+%	Change in Scar Size (% of LV)
1	4.12	-11.64
2	3.09	-18.02
3	3.33	-14.01
4	44.82	-9.75
5	28.26	-6.97
6	30.02	-10.67
7	94.60	-1.82
8	7.72	-14.28
9	38.05	-6.59
10	0.15	-16.74

Table S2. Change in scar size at 12 months for each patient that had CD90 expression data from the CDCs.

LVEFs immediately post-MI				
Control	CDC	c-kit^{DEP} CDC	CD90^{DEP} CDC	Double^{DEP} CDC
30.37	21.94	32.89	36.73	28.93
35.35	29.44	28.42	34.01	32.87
29.89	26.94	31.58	34.07	29.06
26.35	26.14	33.81	27.87	37.03
29.13	33.51	28.34	32.29	26.55
33.13	23.69	36.21	19.96	30.05
	26.26	32.42	23.25	29.04
	38.79	27.81	17.97	28.31
	32.98	28.92	26.24	32.65
	26.82	30.67	30.64	31.98
	33.97	33.42	27.43	17.56
	25.11	24.98	25.20	19.11
	30.43	30.56	27.01	
	29.11	31.11	37.71	
			20.21	
LVEFs at 3 weeks				
Control	CDC	c-kit^{DEP} CDC	CD90^{DEP} CDC	Double^{DEP} CDC
18.56	36.21	43.57	41.42	42.35
21.71	27.50	31.21	40.79	43.28
21.20	30.84	29.47	40.18	37.56
27.58	34.25	41.78	35.41	35.98
28.67	37.31	30.62	37.66	40.22
19.80	29.91	47.28	34.73	39.15
	29.99	35.95	46.88	42.35
	29.17	33.10	41.12	43.28
	30.70	27.65	37.84	37.56
	32.54	29.33	39.94	35.98
	36.83	35.11	33.30	40.22
	34.26	30.12	37.42	39.15
	37.10	29.32	42.09	
	31.20	35.08	42.27	
			41.42	

Table S3. Individual measurements of LVEFs.

Supplemental Figures and Legend

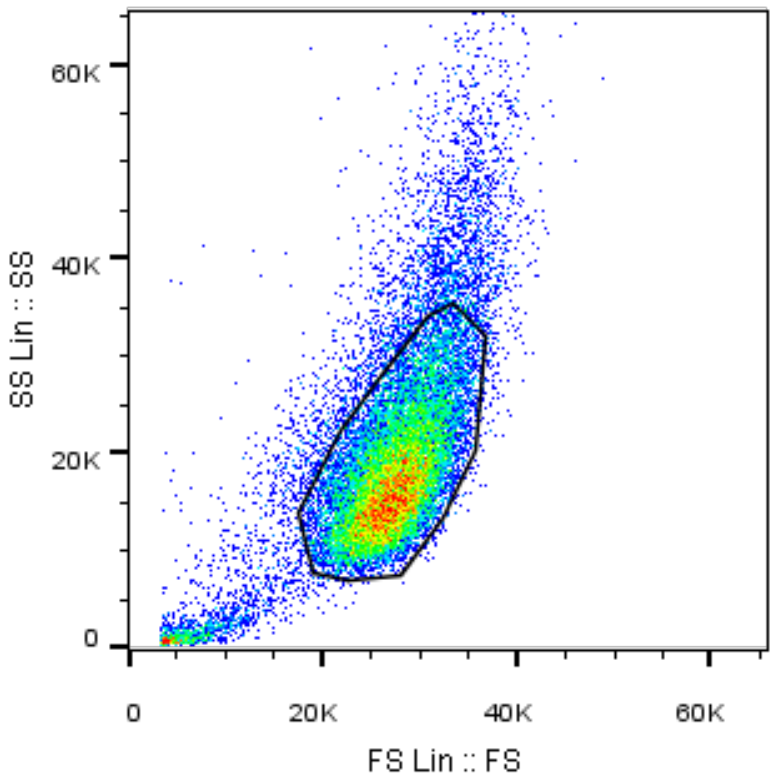

Figure S1. Gating strategy for flow cytometry analysis.

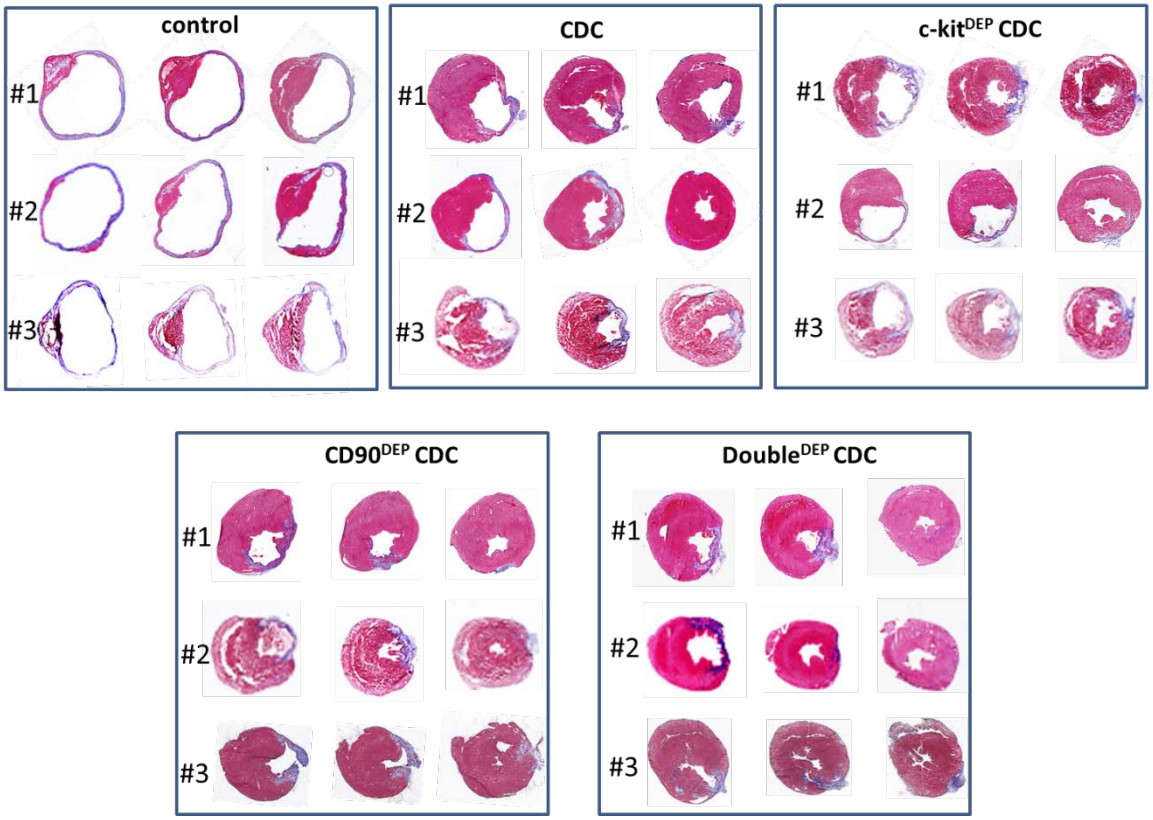

Figure S2. Masson's Trichrome staining of heart sections (3 per animal) from three representative animals in each group.

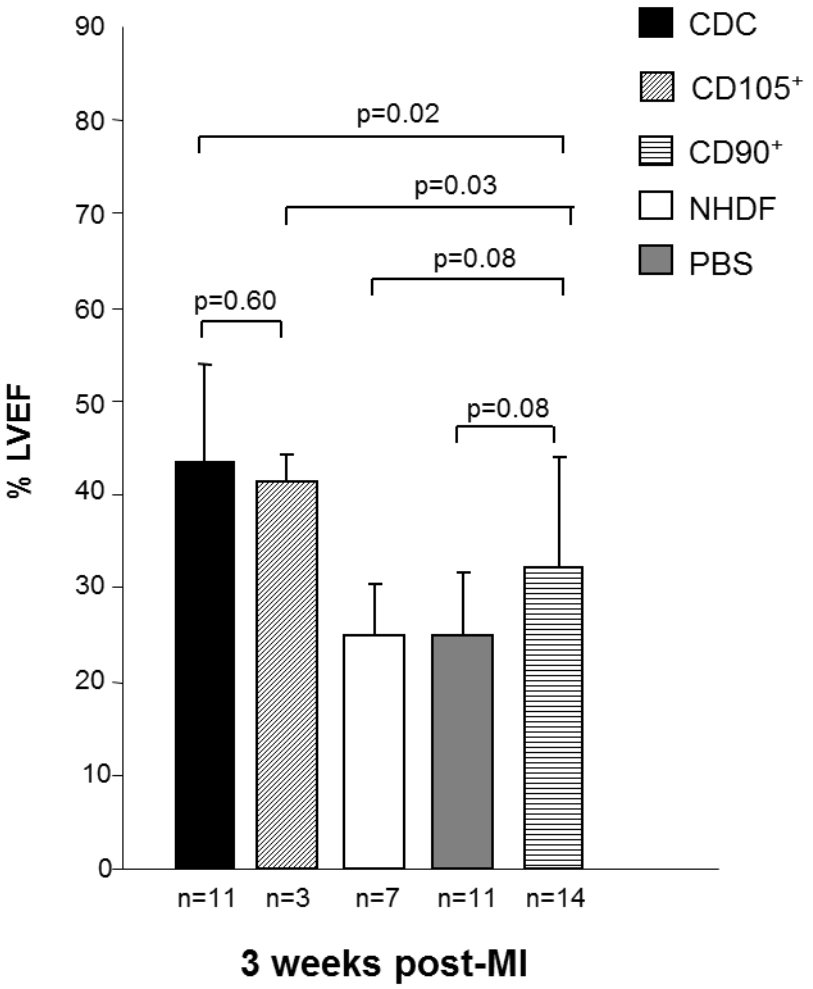

Figure S3. Unsorted CDCs are more potent than CD90$^+$ subpopulations in augmenting cardiac function. In a separate set of studies (partially reported earlier by Li et al., 2012), CD90$^+$ CDCs were selected using magnetic-activated cell sorting. Acute MIs were created in SCID mice and various groups of CDCs, dermal fibroblasts (NHDFs), or PBS were injected into the border zone. Echocardiograms were performed 3 weeks post-MI to measure left ventricular ejection fraction (LVEF). CD105$^+$-sorted CDCs-injected mice were comparable to an historical control group of unsorted CDC-injected mice, indicating that the sorting process did not itself impair the therapeutic

potential of CDCs. $CD90^{+}$-injected mice were significantly outperformed by the $CD105^{+}$-injected or unsorted CDC-injected mice. Error bars = standard deviations.

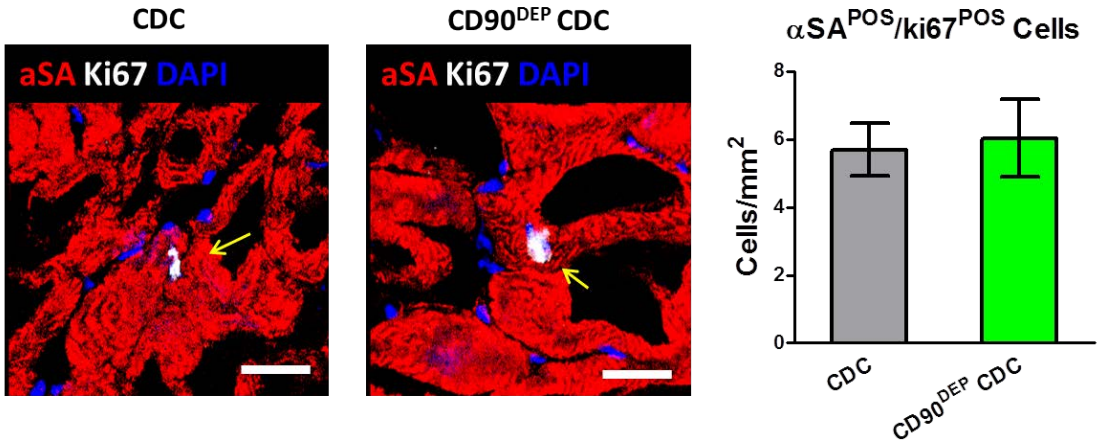

Figure S4. CD90 depletion dose not enhance CDCs' ability to promote cardiomyocyte cycling in vivo. Heart sections obtained 3 weeks after treatment were stained for Ki67 (white) as the proliferation marker. Bars = 50 μm. Error bars = standard deviations.

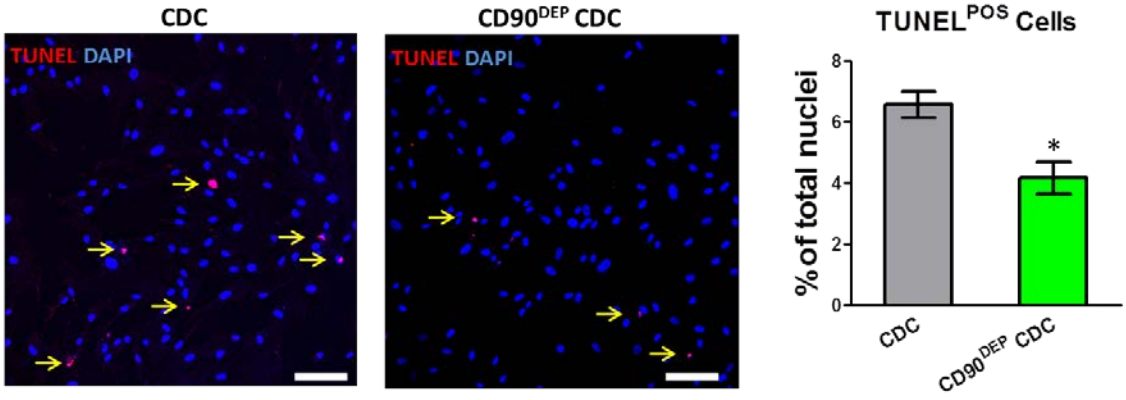

Figure S5. CD90-depleted CDCs are more resistant to oxidative stress than control CDCs. CD90-depleted CDCs and CDCs were cultured in media containing 50 μM H_2O_2

for 24 hrs. Apoptotic cells were detected by TUNEL staining (pink nuclei with yellow arrows). Bars = 50 μm. * indicates $p < 0.05$. Error bars = standard deviations.

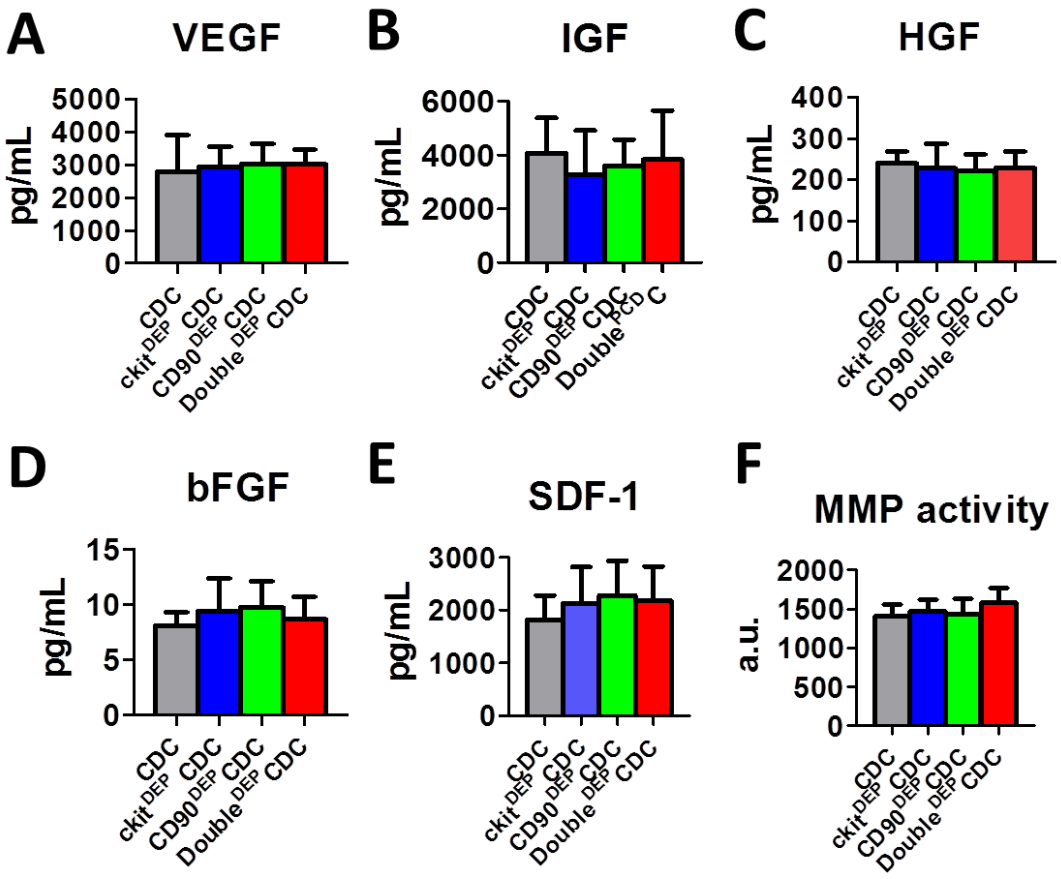

Figure S6. Paracrine factors and proteinolytic activities of CDCs. A-E, Secretion of various growth factors from CDCs. Concentrations were measured by ELISA. F, Proteinolytic activities (MMP2/MMP9) in CDC-conditioned media. All experiments were run in triplicate from three different CDC samples. Error bars = standard deviations.

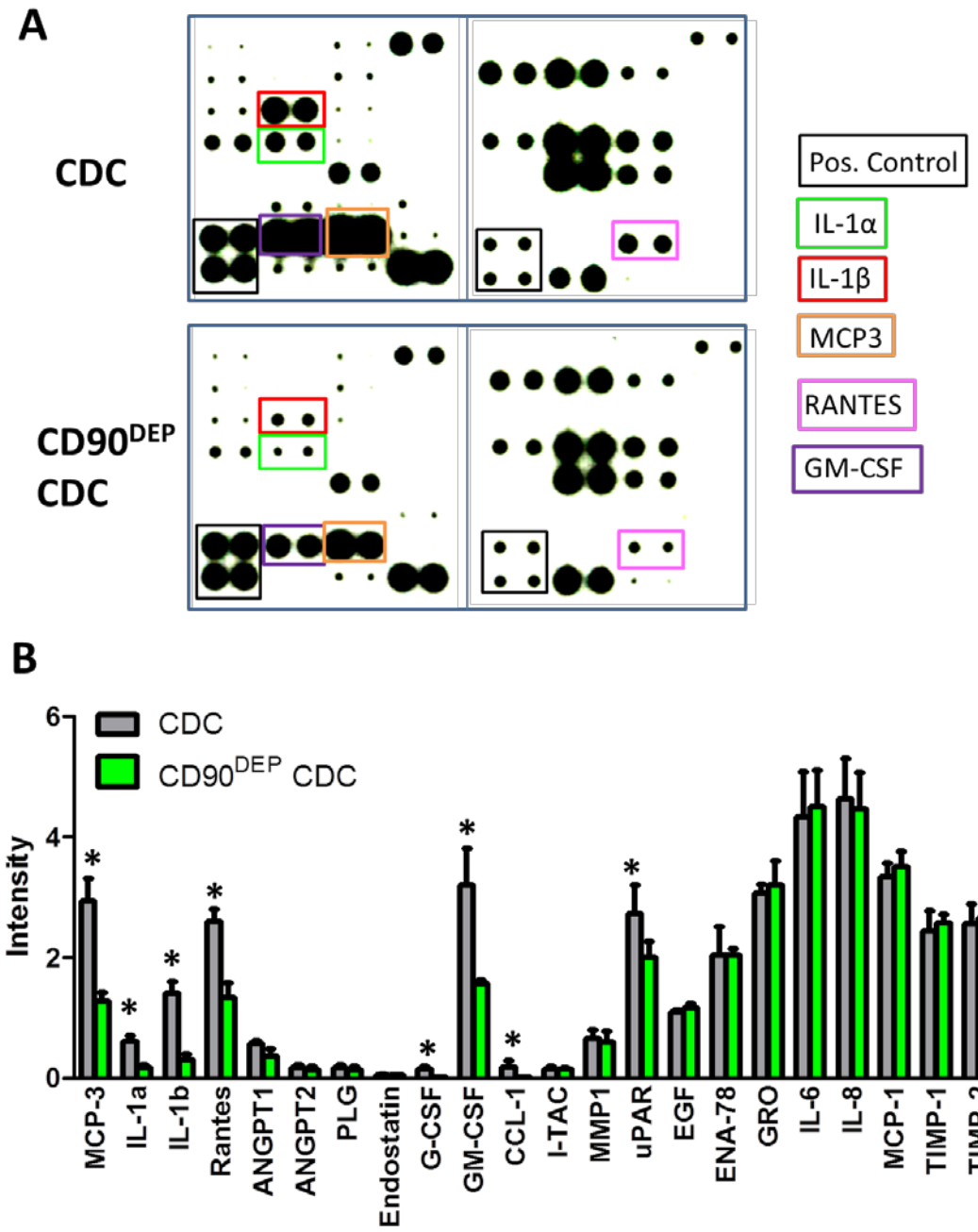

Figure S7. Inflammatory cytokines secreted by CDCs. A, Representative images of cytokine arrays measuring inflammatory cytokines in CDC-conditioned media. Each dot represents a specific cytokine or the positive control protein. Positive control, IL-1α, IL-1beta, MCP3, and RANTES are highlighted. B, Semi-quantitative analysis showing relative levels of cytokines determined with densitometry on the cytokine array and

normalized to the positive control dots. * indicates $P<0.05$ when compared to “CDC”. Data was obtained from three different CDC lines. Error bars = standard deviations.