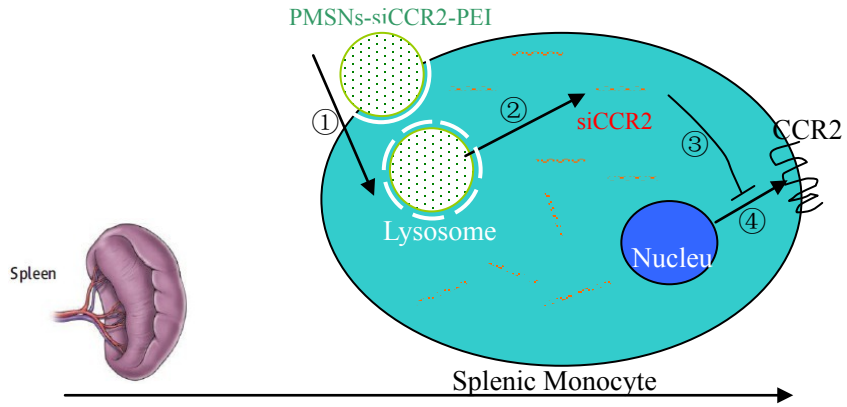
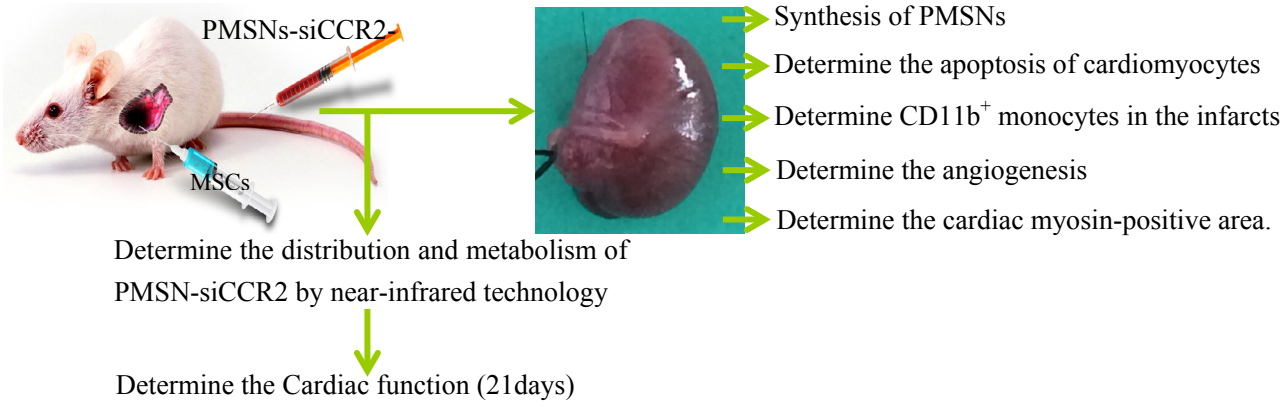
Supplementary Figure 1



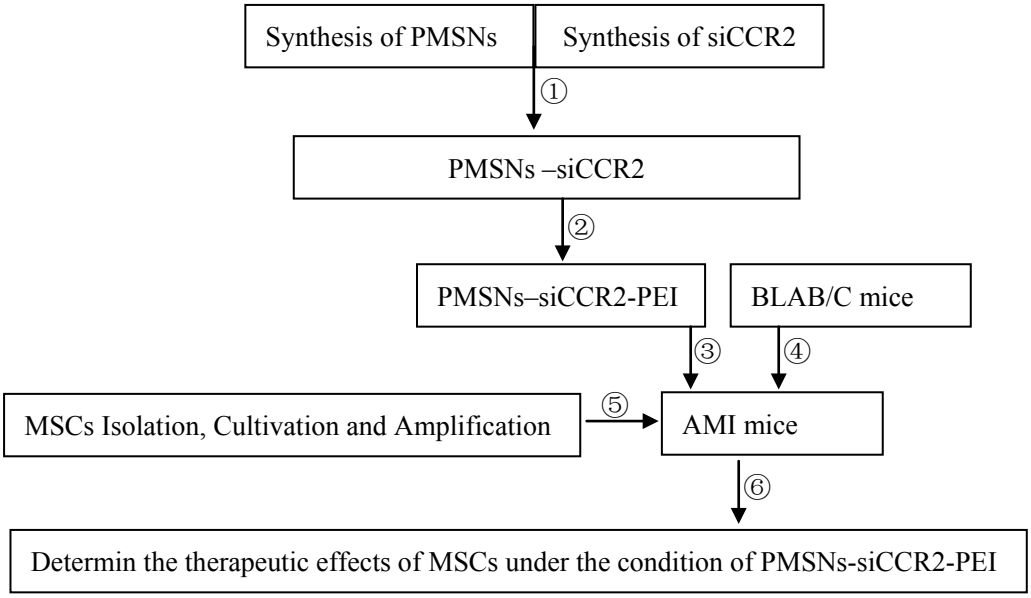
Supplementary Figure 1. Illustration the silence of CCR2 in splenic Ly6C^{high} monocytes, ①The particles of PMSNs-siCCR2-PEI were first phagocytized by the lysosome of monocytes in the spleen; ②Under the proton sponge effect of PEI, lysosomal bursts and siCCR2 released from PMSNs at 37℃; ③and④ siCCR2 silence the mRNA of CCR2 from the nucleus and the synthesis of CCR2 was reduced.

Supplementary Figure 2



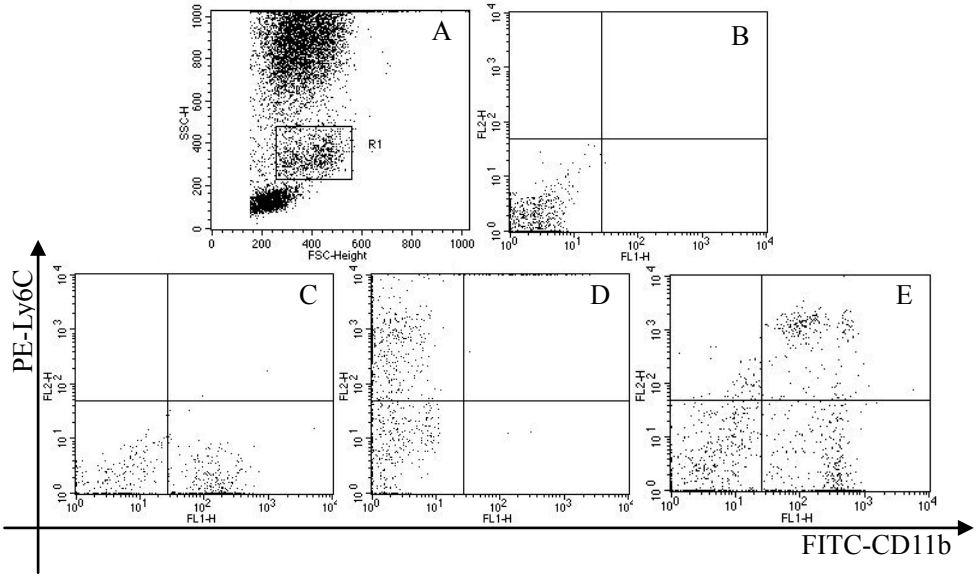
Supplementary Figure 2. Approximate procedure of the experiment in vivo: The distribution and metabolism of PMSN-siCCR2 were first tested in the 24h; CD11b-positive monocytes in the infarcts were then identified at day1; the survival of Transplanted MSCs and the apoptosis of cardiomyocytes were identified at day3; the angiogenesis and the cardiac myosin-positive area as well as Cardiac function were determined at day21.

Supplementary Figure 3



Supplementary Figure 3. Brief flowchart for the whole process of study. ①Loading siCCR2 into PMSNs; ②PEI coating on the external surface of siRNA-loaded PMSNs; ③PMSNs-siCCR2 (25μg/g) were also intravenously injected via the tail vein; ④An anterior wall MI was induced by direct ligation of the left anterior descending (LAD) artery; ⑤MSCs were injected into the borderline area of the infarct; ⑥The therapeutic effects of PMSNs-siCCR2 for MSC transplantation were determined at the mRNA, protein and functional levels.

Supplementary Figure 4



Supplementary Figure 4. Brief flowchart of the FACS gating strategies for inflammatory monocyte. A, Mononuclear Cells were first gated for the further analysis; B, Mononuclear Cells without fluorescent antibody served as control; C, FITC-CD11b was used to identify the monocytes; D, PE-Ly6C was further used to identify the cells; E, CD11b and Ly6C double positive monocytes were gated.

Supplementary Table 1

Mice	ALT (U/L)	AST(U/L)	ALP(U/L)	TBIL (umol/L)	BUN (mmol/L)	Cr（umol/L）
AMI mice (n=12)	17.1±3.11	11.0±0.79	63.2±17.7	1.01±0.12	9.57±1.03	8.81±2.45
AMI mice given PMSNs-siCCR2-PEI(n=12)	19.4±2.47	11.3±0.52	56.5±15.4	1.17±0.13	9.21±2.07	9.06±1.79
P-value	0.133	0.294	0.073	0.425	0.096	0.159

Supplementary Table 1. Hepatic and renal function of the mice treated with or without PMSN-siCCR2-PEI at 24h. ALT, Alanine aminotransferase; AST, Aspartate aminotransferase; BUN, Urea nitrogen; Cr, creatinine; TBIL, Total bilirubin. **P*<0.05 vs. AMI mice.

Supplementary Table 2.

Group	LvEF	LVID.s (mm)	LVID.d (mm)	LVPW.s (mm)	LVPW.d (mm)	LV Vol.s (uL)	LV Vol.d (uL)
Control(day1)	0.33±0.04	4.08±0.45	3.55±0.28	1.21±0.19	0.94±0.12	30.42±5.19	45.40±5.66
Control(day21)	0.42±0.02	3.71±0.29	2.80±0.61	0.99±0.14	0.61±0.08	43.95±6.40	75.80±9.79
PMSN-siCCR2(day1)	0.34±0.05	3.83±0.79	3.14±0.44	1.17±0.22	1.01±0.30	27.75±4.21	42.06±8.73
PMSN-siCCR2(day21)	0.49±0.09$^{*\#}$	3.22±0.36	2.54±0.53	1.02±0.13	0.84±0.11	32.83±5.11	64.36±10.31

Supplementary Table 2. Cardiac functions of the mice in two groups at different time. LvEF, Left ventricular Ejection Fraction; LVID.d/s, Interventricular Septal Thickness at Diastole/ Systole; LVPW.d/s, Left ventricular posterior wall thickness at Diastole/Systole; LV Vol.d/s, Left ventricular end-diastolic/systolic volume ; $^{*}p<0.05$ vs. the corresponding control group at 21 days; $^{\#}p<0.05$ vs. the corresponding control group at day1post AMI.