

Supplemental Methods and Materials

Magnetic resonance imaging (MRI) used in assessment of cardiac function of the transplanted mice. Anesthesia was induced and maintained with isoflurane (1-3% in oxygen). The animal was positioned head first and prone in a 7T Bruker Biospec small animal experimental MRI/MRS scanner (Bruker Biospin MRI, Billerica, MA). A birdcage-style volume resonator with 35mm ID was used for signal excitation and detection. Respiratory signals were monitored using a commercially available standalone system that provides rate information and interfaces with the Biospec console to provide triggering signals. Core temperature was maintained using a circulating warm water pad. Magnetic resonance imaging (MRI) used in assessment of cardiac function of the transplanted mice.

Respiratory synchronized images were acquired using standard pulse sequences. A novel method for retrospectively gating of the heart was used to significantly reduce the acquisition time and improve image quality in cine images used to determine ES and ED volumes for calculating ejection fraction.

A square field of view of 3.5cm yielded in-plane resolution of 136 μ m with 1mm slices. In addition, a fast spoiled gradient echo (FSPGR) sequence with an echo time of 1.4ms was used for “bright blood” imaging of the aortic arch. A flip angle of 50° was used with an average TR of approximately 100ms. The FSPGR sequence described above also operates in cine mode, whereby the entire range

of motion of the cardiac cycle can be observed. The cine protocol acquires 24 frames covering 2 cardiac cycles, which allows for the accurate selection of images representing end of systole (ES) and diastole (ED). For each short axis slice, planimetry measurements of left ventricular myocardial area were conducted offline by tracing the epicardial and endocardial borders at end-systole and end-diastole using ParaVision software (Bruker Biospin MRI, Billerica, MA). For these purposes the papillary muscles were considered part of the left ventricular cavity.

The volume of blood within a given chamber can be calculated using a simple numerical integration algorithm. Volume at the end systole ES and ED of each slice will be determined and added to get the maximum measured volume of blood within the left ventricle (LV) over the entire course of images. Ejection fraction is calculated as the ratio of stroke volume (VED-VES) to end diastolic volume.

Supplemental Figure Legends

Fig 1S. Percentage of HLA/cardiac troponin T-double positive cells in mouse heart at different time points after transplantation with human peripheral blood CD34+ cells. Six mice were examined at each time point and the percentage of HLA+/cardiac troponin+ cells of each animal was plotted. There was no significant differences among the 3 time points ($p>0.1$) when data were analyzed using ANOVA followed by multiple comparisons among the means.

Fig 2S. Effect of transplantation with human CD34+ cells on cardiac function. Mice were MRI scanned before experimental myocardial infarction and cell transplantation to assess cardiac function by examining EF. MRI scanning was then performed again at 1 month post transplantation to assess cardiac function. Changes in function in each mouse was indicated by Δ EF. A). MRI images of the heart of mouse without cell transplantation. The upper panels are images of the heart before MI, and the lower panels are the images of the heart after MI and transplantation. B). MRI images of heart from a representative mouse injected with human peripheral blood CD34+ cells. C). Data summarized from 3 pairs of mice treated with or without CD34+ cells. ($n=3$, $p<0.05$).

Fig 3S. Specificity of the anti-HLA-ABC antibody. A) Mouse HL-1 cells were stained negative for HLA; b) When HL-1 cells were co-cultured with human CD34+ cells the fused cells were detected by anti-HLA antibody.

Fig 1S

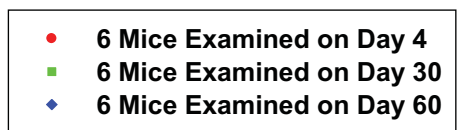
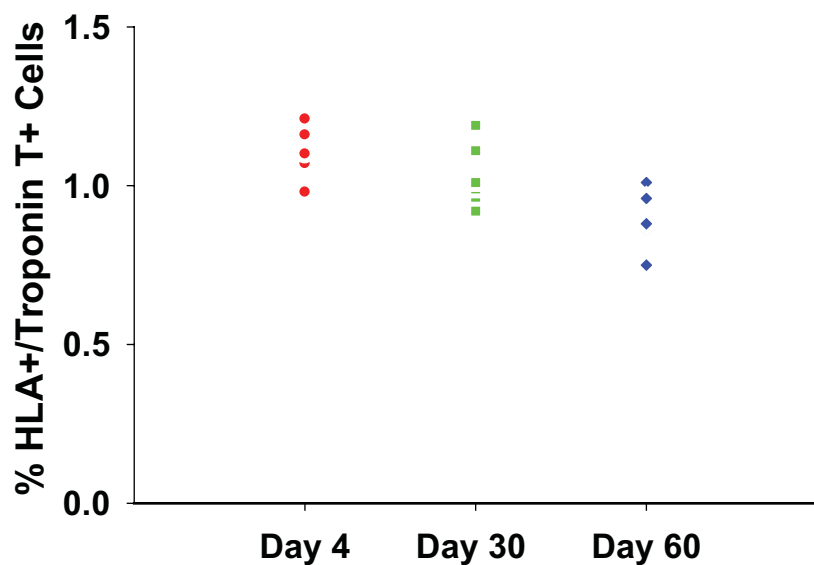
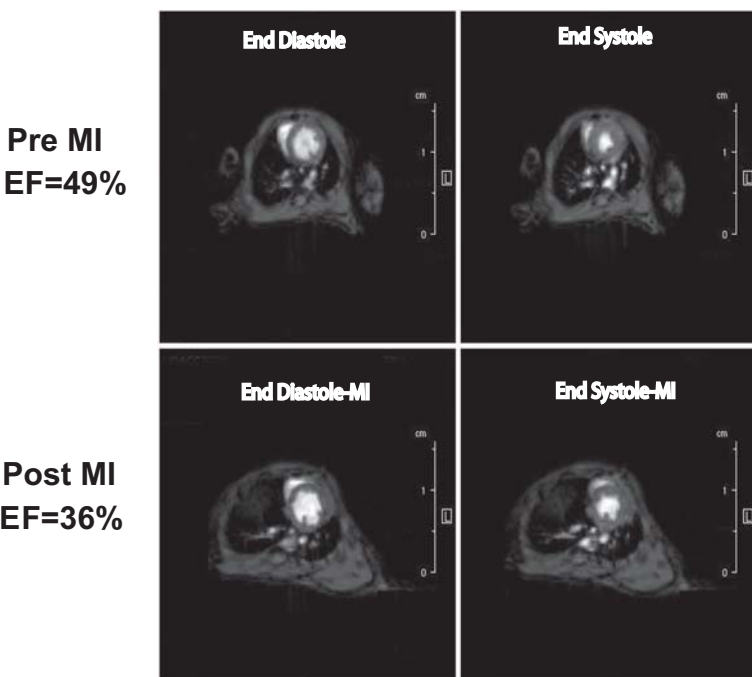
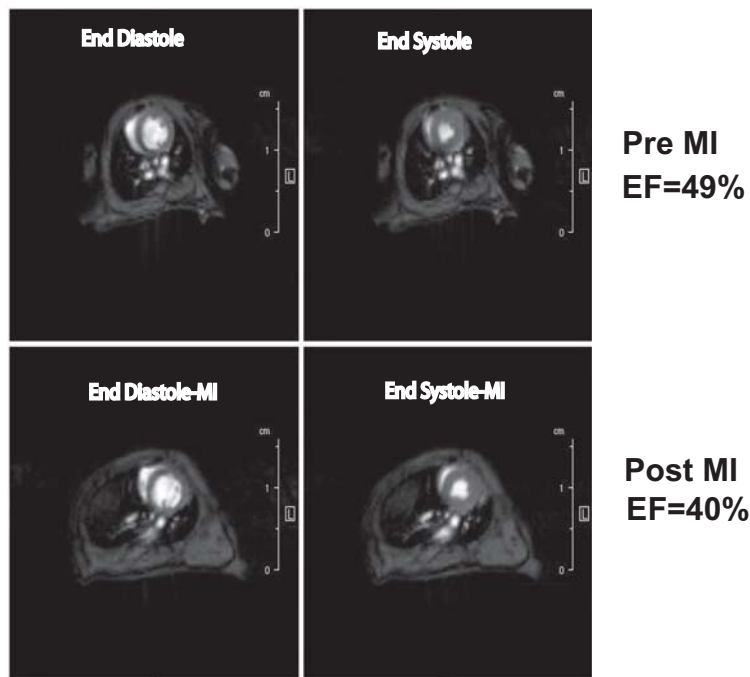


Fig 2S

A



B



C

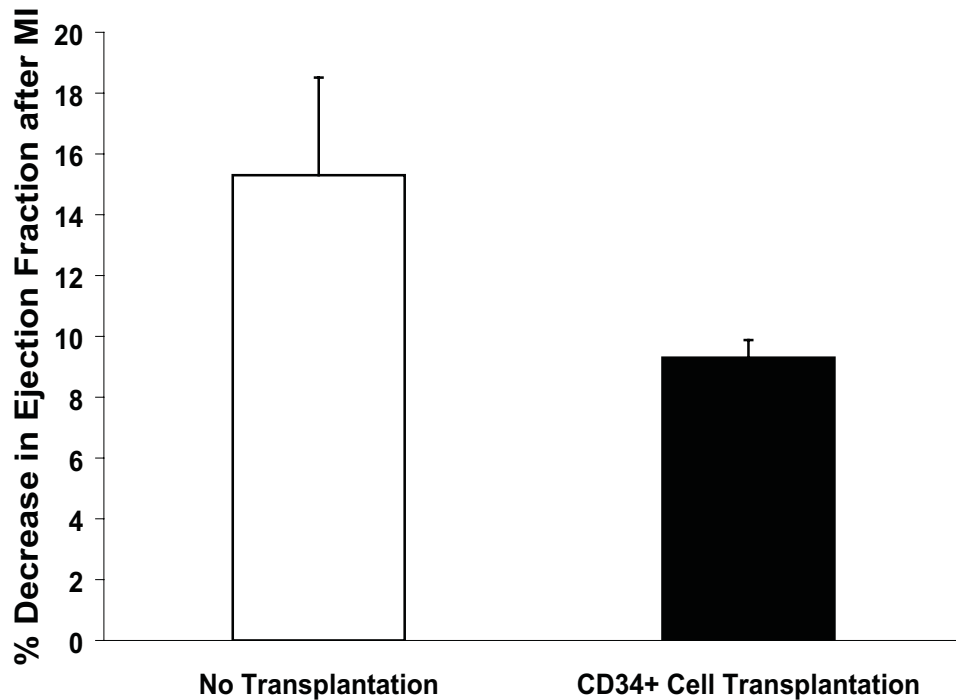


Fig 3S

