**SUPPLEMENTARY FIGURES**

**Supplementary Figure 1. Survival after myocardial infarction and cell therapy.** A total of 138 rats were subjected to MI and assigned to the vehicle (n=64) or CPC-treated group (n=74). Forty-eight rats survived at the 1-year follow-up in the vehicle-treated and 56 in the CPC-treated group. Of the rats that died in the first week after MI, seven died within the first 24 h (four in the vehicle group and three in the CPC-treated group) and five died on days 2-5 (three in the vehicle and two in the CPC group). The survival rate was similar between the two groups.

**Supplementary Figure 2. Myocardial collagen content.** Representative microscopic images of picrosirius red-stained LV sections from a vehicle and a CPC-treated heart obtained using transmission light (**A**) and polarized light (**B**). **C.** Quantitative analysis of myocardial collagen content, calculated using polarized light images and expressed as a percentage of total area in the risk region and posterior wall (noninfarcted region). Data are means ± SEM. The region at risk comprises both the border zones and the scarred region. Bar is 1 mm.

**Supplementary Figure 3A-F.** **Effect of CPC transplantation on vascular density at 1 year.**  Vascular density was determined 1 year after CPC infusion in vehicle- and CPC-treated hearts that received BrdC infusion during the 12th month.  Shown are representative confocal microscopic images acquired from the border zone in vehicle-treated (**A**) and CPC-treated (**B**) groups. Immunofluorescent staining was conducted with a specific anti-isolectin B4 antibody (to identify vascular endothelial cells; green), anti-α-actin antibody (to identify smooth muscle cells; red), and anti-BrdU antibody (to identify newly-formed cells; white). Nuclei were stained with DAPI (blue). Myocardial morphology was examined with the confocal ChD detector under transmitted light in which the pseudocolor selected for the ChD channel was gray white. **C-F.** Quantitative analyses of vessel density, number of BrdUPOS vessels, and number of BrdUPOS endothelial cells (i.e., vascular proliferation). Data are means ± SEM. The region at risk comprises both the border zones and the scarred region. Bar is 10 µm.

**Supplementary Figure 3G-H. Effect of CPC transplantation on vascular diameter at 1 year**. Vascular diameter was determined on confocal microscope images acquired from vehicle- and CPC-treated hearts stained with a specific anti-isolectin B4 antibody (n=6/group). The risk region comprises both the border zones and the scarred region. Note that, compared with vehicle-treated hearts, CPC-treated hearts contained a larger number of vessels with a diameter of 10-60 micrometers in both the risk region and the noninfarcted region.

**Supplementary Figure 3I-K. Effect of CPC transplantation on vascular diameter at 1 year**. Confocal microscope images acquired from vehicle- and CPC-treated hearts stained with a specific anti-isolectin B4 antibody were utilized to analyze the distribution frequency of vessel diameter in the risk region (border zones and scar area) (**I**) and in the noninfarcted region (**J**). **K**. Box-and-whisker plot showing vessel diameter in the risk and noninfarcted regions of vehicle- and CPC-treated hearts. Boxes show the median and the 1st and 3rd quartile (25th and 75th percentile); whiskers show the 1st and last decile (10th and 90th percentile); dots show the smallest and largest observations. Note that the distribution of vessel diameter in the CPC group was shifted to the right in both the risk region (**I**) and the noninfarcted region (**J**), and that the median vessel diameter in the CPC group was significantly increased both in the risk region and noninfarcted region (**K**), indicating that CPC therapy promoted formation of larger vessels.

**Supplementary Figure 4.** **Effect of CPC transplantation on myocyte density at 1 year.**  Myocyte density was determined 1 year after CPC infusion in vehicle- and CPC-treated hearts stained with WGA (green) and α-SA (red).  Shown are representative confocal microscope images acquired from the scarred regions in vehicle- (**A**) and CPC-treated (**B**) rats. Since the myocytes are multinucleated, the WGA/α-[SA](https://www.google.com/search?q=Sarcomeric+Actin&spell=1&sa=X&ved=0ahUKEwjP_arSm-fJAhUIbSYKHYbLCGAQvwUIGigA&biw=1280&bih=589&dpr=1.5) double stained images were used to assess myocyte density. WGA binds specifically to the myocyte membrane, thereby facilitating the identification and evaluation of myocyte density. Since myocytes are ~100 μm in length, their nuclei may not be present in horizontally sectioned myocytes; the ratio of myocyte nuclei to myocytes is about 1:4 in the current study (**A** and **B**). **C.** Quantitative analyses of the numbers of myocytes per mm2. Data are means ± SEM. The region at risk comprises both the border zones and the scarred region. Bar is 20 µm.

**Supplementary Fig. 5. Quantitative analysis of BrdUpos/α-SApos cells in the risk region, expressed as a percentage of total nucleated α-SApos cells.** Vehicle- and CPC-treated rats received BrdC infusion on the 3rd, 7th, or 12th month after CPC transplantation and then were sacrificed at 1 year. Confocal microscope images acquired from BrdU/α-SA double stained heart sections were utilized for quantitative analysis (Fig. 5). The risk region comprises both the border zones and the scarred region. Data are means ± SEM.

**Supplementary Figure 6. Proliferation of CPCs (c-kitPOS/CD45NEG cells) 1 year after cell transplantation.**  This figure is an enlargement of Figs. 7A-G. **A.** Representative confocal microscopic image obtained from the border zone. **B, C, and D** are higher magnification images of the upper-left box in **A; E, F, and G** are higher magnification images of the lower–right box in **A**. Green arrowheads indicate c-kitPOS/CD45NEG cells (i.e., CPCs), whereas yellow asterisks indicate c-kitPOS/CD45POS cells (i.e., hematopoietic stem cells). C-kit expression is shown in green, BrdU in white, and CD45 in red; c-kit/CD45 double positive cells are yellow, myocyte morphology is shown in gray white, and nuclei are blue (DAPI). Myocardial morphology was examined with the confocal ChD detector under transmitted light, in which the pseudocolor selected for the ChD channel was gray white. Bar is 10 µm.

**Supplementary Figure 7. Evaluation of Y-chromosomePOS, c-kitPOS, and BrdUPOS cells 1 year after cell transplantation.** Representative confocal microscopic image obtained from the scarred region. This figure is an enlargement of Fig. 8A. Nuclei are stained with DAPI (blue). **A.** Green arrowheads indicate Y-chromosome fluorescent signals (green/cyan). **B.** Red arrowheads indicate c-kit positive cells (red). **C.** Merged images A and B. Green arrowheads indicate Y-chromosome fluorescent signals (green/cyan). Positivity for c-kit is shown in red and BrdU in white. The red arrowhead indicates a c-kit positive, BrdU negative, and Y-chromosome negative cell. Yellow asterisks indicate c-kit and BrdU double positive cells. Bar is 10 µm.

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