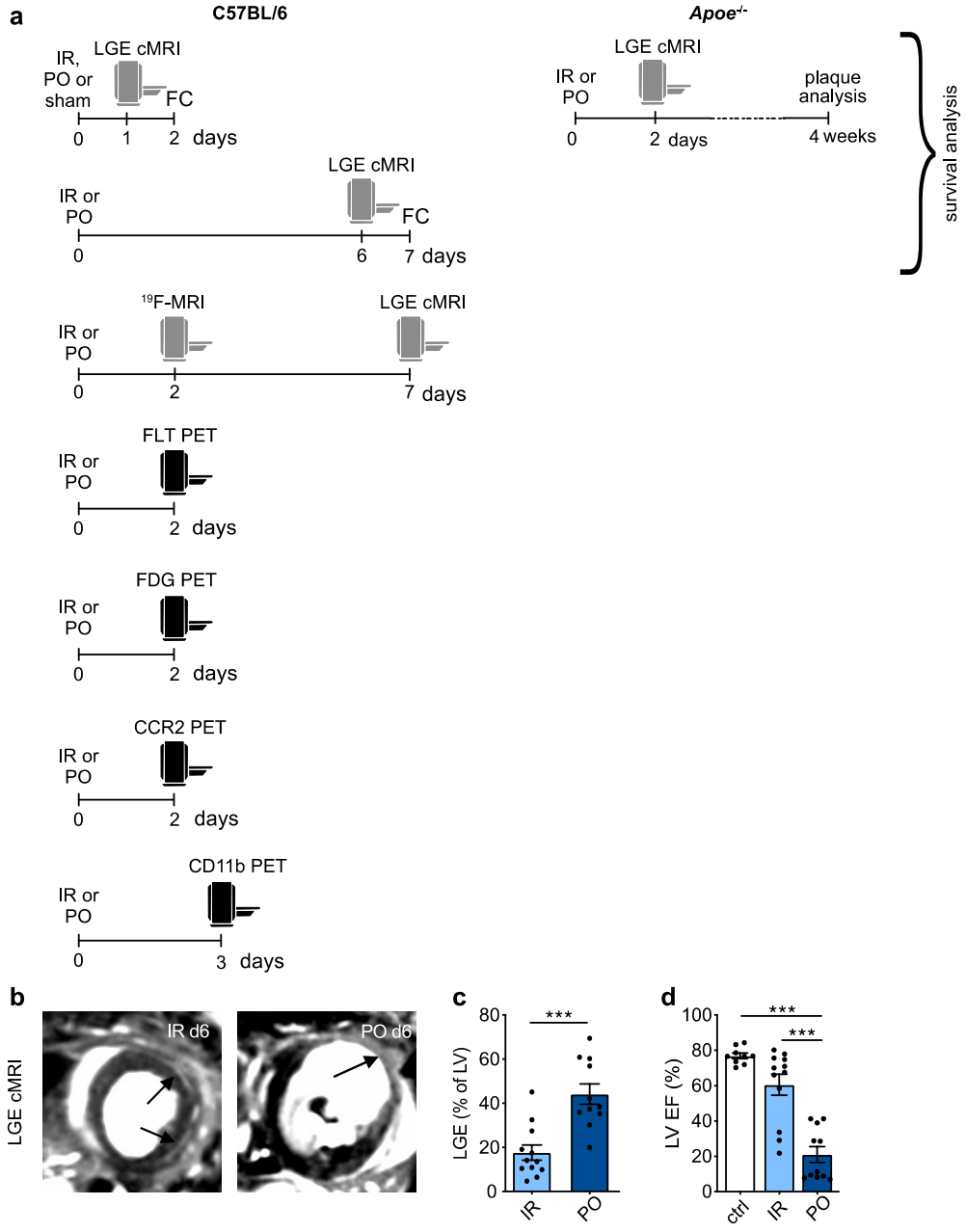
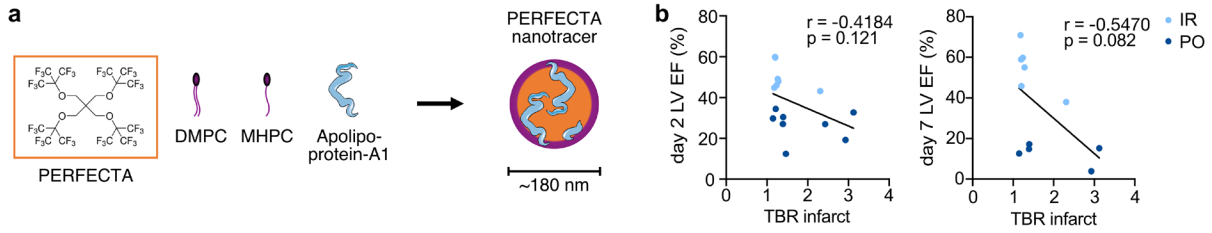
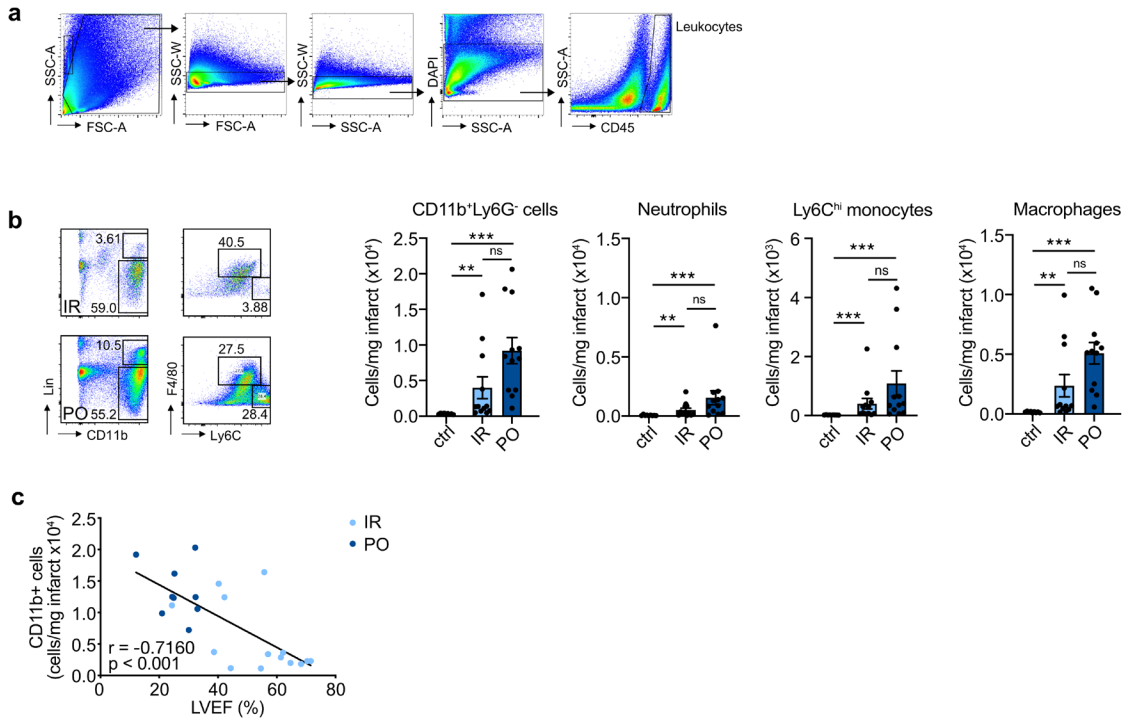
Supplemental Figure 1. Study protocol and cardiac MRI 6 days after myocardial infarction. (a) Study protocol for C57BL/6 and Apoe$^{-/-}$ mice and each imaging modality/tracer. FC = Flow cytometry. (**b**) Representative LGE cMR images on day 6 after myocardial infarction; arrows indicate LGE area. (**c**) LGE area in % of the left ventricle 6 days after surgery (n = 9-14, p < 0.001, two-tailed Student's t-test). (**d**) Left ventricular ejection fraction (LVEF) 6 days after surgery (n = 9-12, p < 0.001 for ctrl vs. PO and IR vs. PO, p = 0.058 for ctrl. vs. IR, one-way ANOVA). Data are presented as mean ± standard error of the mean, unless otherwise specified. Symbols used are specified as *p < 0.05, **p < 0.01 and ***p < 0.001.



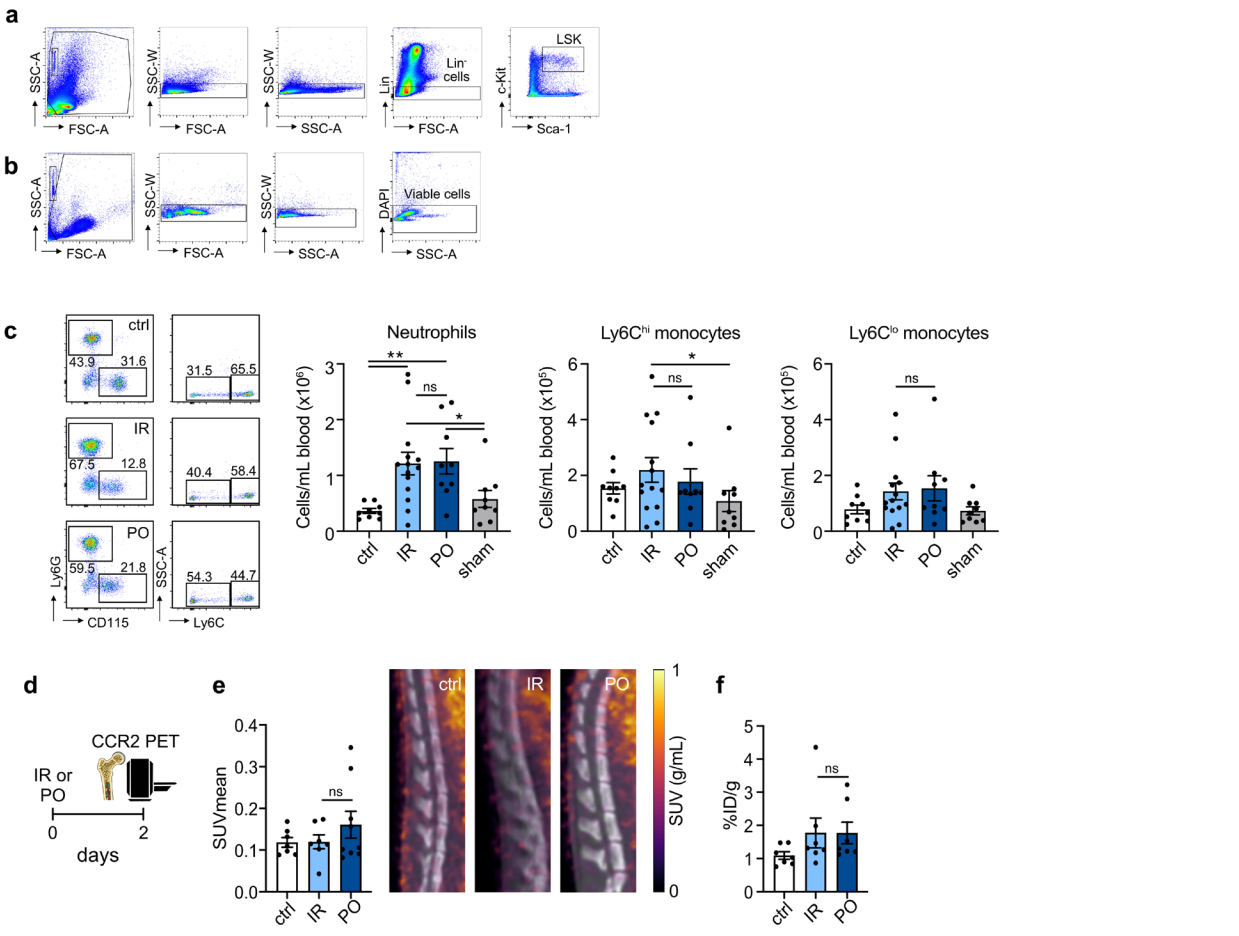
Supplemental Figure 2. ^{19}F-MRI nanotracer and ^{19}F infarct/LVEF correlations (**a**) Components and schematic representation of the PERFECTA nanotracer. The nanotracer consists of PERFECTA, DMPC, MHPC and Apolipoprotein A1. PERFECTA, 1,3-bis[[1,1,1,3,3,3-hexafluoro-2-(trifluoromethyl)propan-2-yl]oxy]-2,2-bis[[1,1,1,3,3,3-hexafluoro-2-2(trifluoromethyl)propan-2-yl]oxymethyl]propane; DMPC, 1,2-Dimyristoyl-*sn*-glycero-3-phosphocholine; MHPC, 1-myristoyl-2-hydroxy-*sn*-glycero-3-phosphocholine. (**b**) PERFECTA target-to-background-ratio (TBR) in the infarct and left ventricular ejection fraction (LVEF) are inversely correlated on day 2 and 7 after IR/PO.



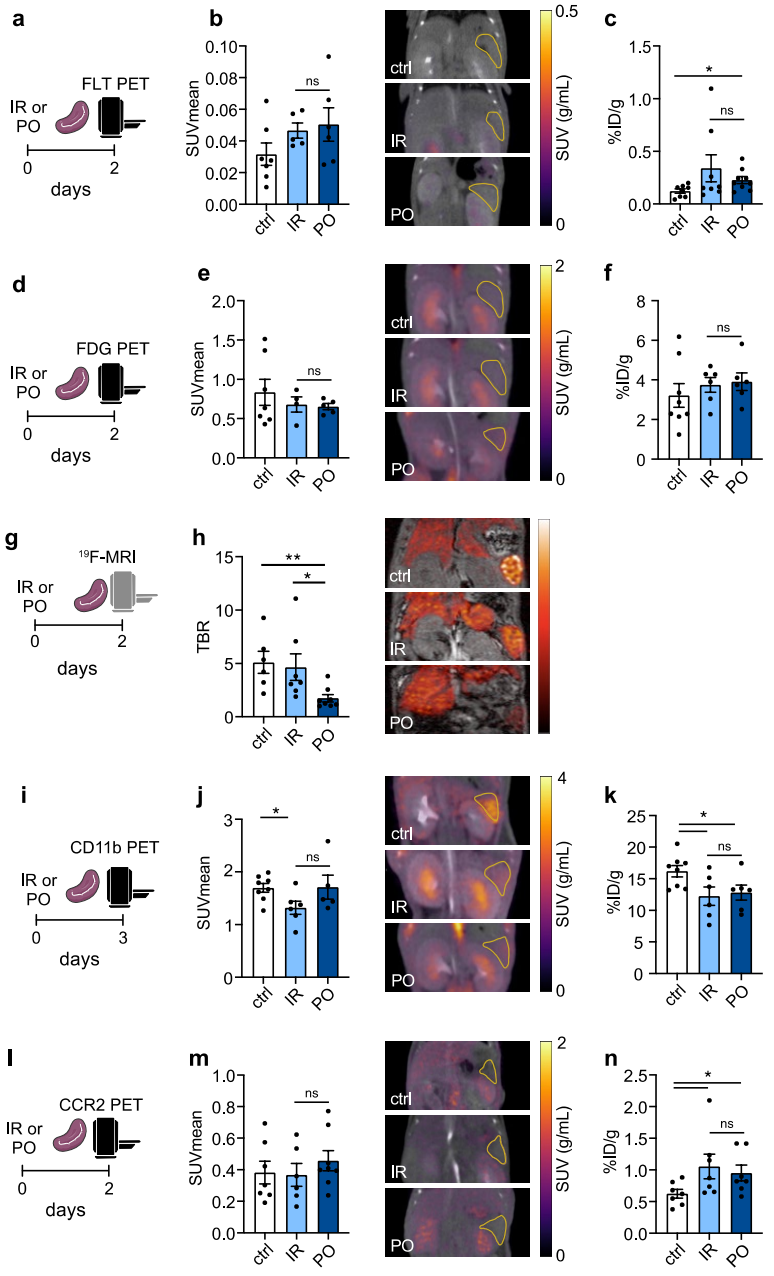
Supplemental Figure 3. Myeloid cell numbers in the ischemic myocardium and correlation with left ventricle ejection fraction. (**a**) The flow cytometry gating strategy used to identify leukocytes in the heart (infarct zone) and aorta. (**b**) Representative flow cytometry plots of the IR and PO infarct areas 7 days after myocardial infarction. IR upper row, PO lower row. Following $CD11b^{+}/Ly6G^{-}$ (n = 9-12, p = 0.002 ctrl. vs. IR; p < 0.001 ctrl. vs. PO; p = 0.091 IR vs. PO, Kruskal-Wallis test), neutrophil (n = 9-12, p = 0.007 ctrl. vs. IR; p < 0.001 ctrl. vs. PO; p = 0.12 IR vs. PO, Kruskal-Wallis test), $Ly6C^{hi}$ monocytes (n = 9-12, p < 0.001 ctrl. vs. IR; p < 0.001 ctrl. vs. PO; p = 0.28 IR vs. PO, Kruskal-Wallis test) and macrophage numbers (n = 9-12, p = 0.005 ctrl. vs. IR; p < 0.001 ctrl. vs. PO; p = 0.080 IR vs. PO, Kruskal-Wallis test). (**c**) $CD11b^{+}$ cell numbers in the infarct and left ventricular ejection fraction (LVEF) are inversely correlated on day 2 after IR/PO. Data are presented as mean ± standard error of the mean, unless otherwise specified. Symbols used are specified as *p < 0.05, **p < 0.01 and ***p < 0.001.



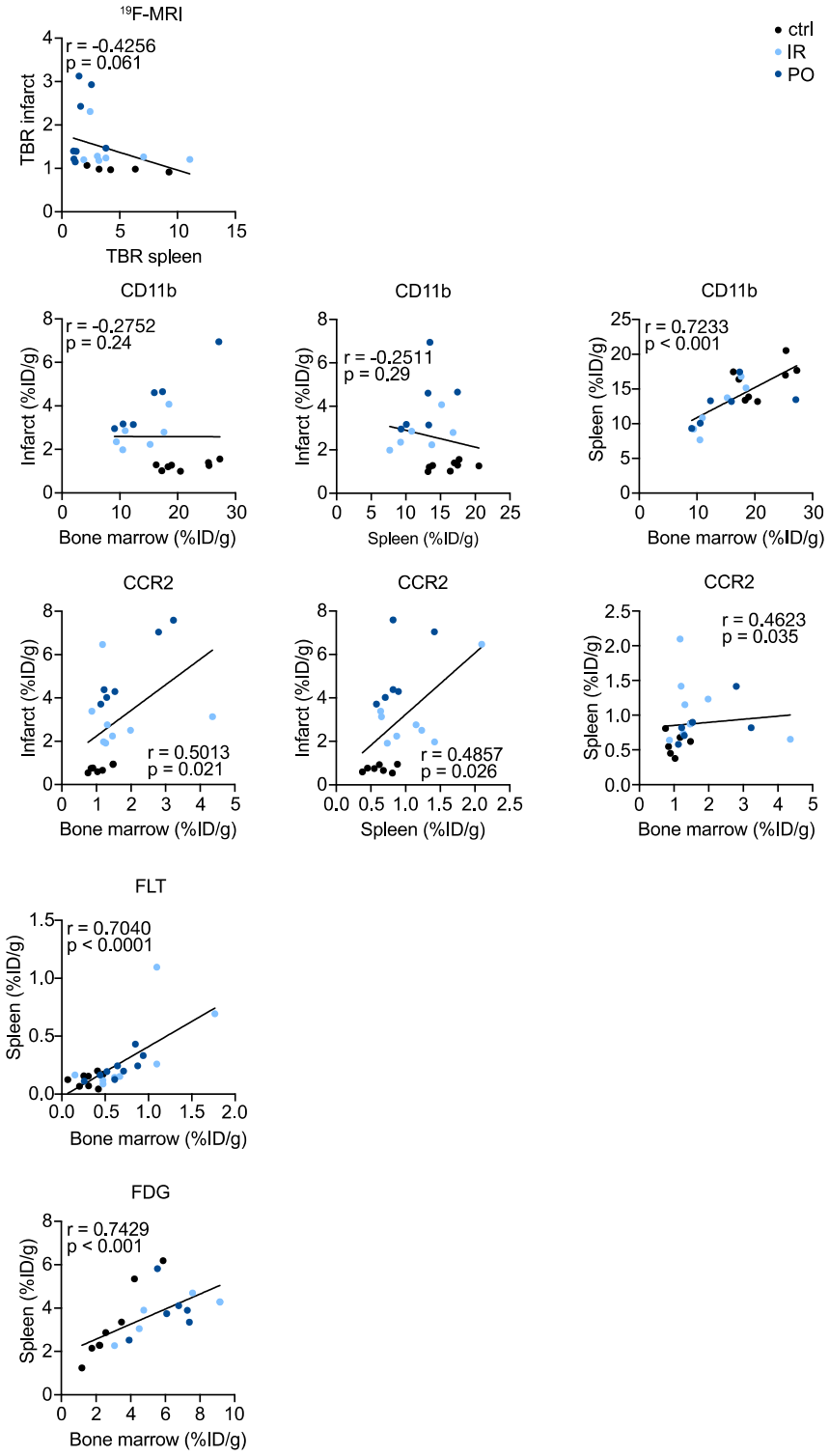
Supplemental Figure 4. Blood myeloid cell numbers after IR/PO and CCR2 imaging of the bone marrow. (**a**) Flow cytometry gating strategy for bone marrow progenitors. (**b**) Gating strategy for viable cells in the blood. (**c**) Neutrophils (n = 9-14, p = 0.002 ctrl. vs. IR; p = 0.003 ctrl. vs. PO; p = 0.39 ctrl. vs. sham; p = 0.87 IR vs. PO; p = 0.027 IR vs. sham; p = 0.032 PO vs. sham, Kruskal-Wallis test), Ly6C^{hi} monocytes (n = 9-14, p = 0.77 ctrl. vs. IR; p = 0.62 ctrl. vs. PO; p = 0.070 ctrl. vs. sham; p = 0.40 IR vs. PO; p = 0.021 IR vs. sham; p = 0.19 PO vs. sham, Kruskal-Wallis test) and Ly6C^{lo} monocytes (n = 9-14, p = 0.13 ctrl. vs. IR; p = 0.16 ctrl. vs. PO; p = 0.81 ctrl. vs. sham; p = 0.96 IR vs. PO; p = 0.076 IR vs. sham; p = 0.098 PO vs. sham, Kruskal-Wallis test) in the blood 2 days after myocardial infarction compared to naïve controls and sham controls. (**d**) ^{64}Cu-DOTA-ECL1i PET/CT of the bone marrow was performed 2 days after IR/PO surgery. The scan was conducted during the first 60 minutes after injection. (**e**) Quantification of ^{64}Cu-DOTA-ECL1i signal in the lumbar vertebrae and representative CCR2 PET images. The CCR2 tracer bone marrow signal did not show significant differences between mice with IR/PO and controls (n = 7 – 9, p = 0.58 ctrl. vs. IR; p = 0.54 ctrl. vs. PO; p = 0.98 IR vs. PO, Kruskal-Wallis test). (**f**) *Ex vivo* gamma counting of CCR2 tracer uptake in the bone marrow (n = 7, p = 0.12 ctrl. vs. IR; p = 0.070 ctrl. vs. PO; p = 0.80 IR vs. PO, Kruskal-Wallis test). Data are presented as mean ± standard error of the mean, unless otherwise specified. Symbols used are specified as *p < 0.05, **p < 0.01 and ***p < 0.001.



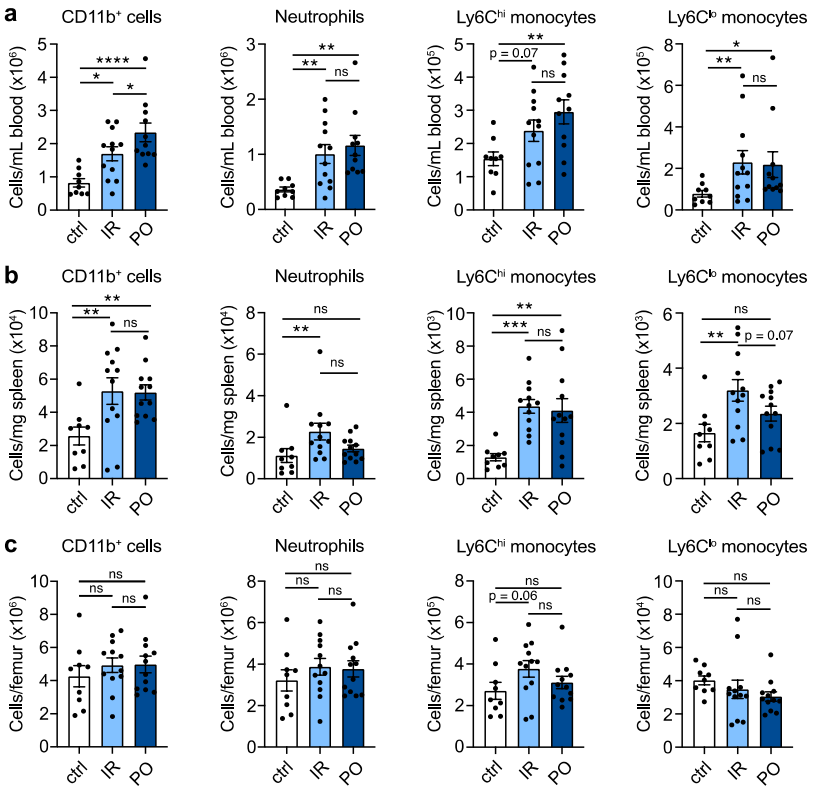
Supplemental Figure 5. Multiparametric imaging of the spleen following ischemia-reperfusion and permanent LAD occlusion. (**a**) ^{18}F-FLT PET/CT was performed 2 days after IR/PO surgery; ^{18}F-FLT was injected 90 minutes prior the scan. (**b**) Quantification of ^{18}F-FLT signal in the spleen and representative ^{18}F-FLT PET/CT images (p = 0.15 ctrl. vs. IR; p = 0.12 ctrl. vs. PO; p = 0.97 IR vs. PO). (**c**) *Ex vivo* gamma counting of ^{18}F-FLT uptake in the spleen (n = 8-9, p = 0.14 ctrl. vs. IR; p = 0.042 ctrl. vs. PO; p = 0.62 IR vs. PO, Kruskal-Wallis test). (**d**) ^{18}F-FDG PET/CT was performed 2 days after IR/PO surgery. ^{18}F-FDG was injected 30 minutes before imaging. (**e**) Quantification of ^{18}F-FDG signal in the spleen and representative ^{18}F-FDG PET/CT images. (**f**) *Ex vivo* gamma counting of ^{18}F-FDG uptake in the spleen. Both showing no significant differences. (**g**) ^{19}F-MRI of the spleen 2 days after IR/PO surgery and 1 day after PERFECTA nanotracer injection. (**h**) Quantification of fluorine uptake in the spleen, expressed as target-to-background ratio (n = 6-8, p = 0.58 ctr. vs. IR; p = 0.004 ctrl. vs. PO; p = 0.015 IR vs. PO, Kruskal-Wallis test), and representative fused ^{19}F-MR images. (**i**) ^{89}Zr-CD11b nanobody PET/CT was performed 3 days after IR/PO surgery. The nanobody was injected 2 days after surgery. (**j**) Quantification of ^{89}Zr-CD11b nanobody signal in the spleen (n = 5-8, p = 0.020 ctrl. vs. IR; p = 0.54 ctr. vs. PO; p = 0.13 IR vs. PO, Kruskal-Wallis test) and representative ^{89}Zr-CD11b nanobody PET/CT images. (**k**) *Ex vivo* gamma counting of ^{89}Zr-CD11b nanobody uptake in the spleen (n = 6-8, p = 0.041 ctrl. vs. IR; p = 0.046 ctrl. vs. PO; p = 0.96 IR vs. PO, Kruskal-Wallis test). (**l**) ^{64}Cu-DOTA-ECL1i PET/CT of the spleen was performed 2 days after IR/PO surgery, during the first 60 minutes after injection. (**m**) Quantification of CCR2 tracer signal in the spleen and representative ^{64}Cu-DOTA-ECL1i PET/CT images. (**n**) *Ex vivo* gamma counting of CCR2 tracer uptake the spleen (n = 7, p = 0.039 ctrl. vs. IR; p = 0.039 ctrl. vs. PO; p > 0.99 IR vs. PO, Kruskal-Wallis test). Data are presented as mean ± standard error of mean, unless otherwise specified. Symbols used are specified as *p < 0.05, **p < 0.01 and ***p < 0.001.


a
FLT PET
IR or PO
0
2
days
b
SUVmean
0.10
0.08
0.06
0.04
0.02
0.00
ns
ctrl
IR
PO
ctrl
IR
PO
SUV (g/mL)
0.5
0
c
%ID/g
1.5
1.0
0.5
0.0
*
ns
ctrl
IR
PO
d
FDG PET
IR or PO
0
2
days
e
SUVmean
2.0
1.5
1.0
0.5
0.0
ns
ctrl
IR
PO
ctrl
IR
PO
SUV (g/mL)
2
0
f
%ID/g
8
6
4
2
0
ns
ctrl
IR
PO
g
19F-MRI
IR or PO
0
2
days
h
TBR
15
10
5
0
**
*
ctrl
IR
PO
ctrl
IR
PO
i
CD11b PET
IR or PO
0
3
days
j
SUVmean
3
2
1
0
*
ns
ctrl
IR
PO
ctrl
IR
PO
SUV (g/mL)
4
0
k
%ID/g
25
20
15
10
5
0
*
ns
ctrl
IR
PO
l
CCR2 PET
IR or PO
0
2
days
m
SUVmean
1.0
0.8
0.6
0.4
0.2
0.0
ns
ctrl
IR
PO
ctrl
IR
PO
SUV (g/mL)
2
0
n
%ID/g
2.5
2.0
1.5
1.0
0.5
0.0
*
ns
ctrl
IR
PO

Supplemental Figure 6. Correlations between tracer uptake in tissues of interest.
Spearman's correlations between tracer uptake in the infarct, spleen and/or bone marrow. For ^{19}F-MRI, *in vivo* target-to-background ratios were used. For the PET tracers, *ex vivo* gamma counting data were used.



Supplemental Figure 7. Myeloid cell numbers by flow cytometry of the blood, spleen, and bone marrow 7 days after IR/PO. (**a**) Blood. CD11b^{+}/Ly6G^{-} cells (n = 9-12, p = 0.012 ctrl. vs. IR; p < 0.001 ctrl. vs. PO; p = 0.046 IR vs. PO, one-way ANOVA), Neutrophils (n = 9-12, p = 0.008 ctrl. vs. IR; p = 0.002 ctrl. vs. PO; p = 0.47 IR vs. PO, one-way ANOVA), Ly6C^{hi} monocytes (n = 9-12, p = 0.072 ctrl. vs. IR; p = 0.005 ctrl. vs. PO; p = 0.20 IR vs. PO, one-way ANOVA) and Ly6C^{lo} monocytes (n = 9-12, p = 0.010 ctrl. vs. IR; p = 0.016 ctrl. vs. PO; p = 0.90 IR vs. PO, Kruskal-Wallis test). (**b**) Spleen. CD11b^{+}/Ly6G^{-} cells (n = 9-12, p = 0.007 ctrl. vs. IR; p = 0.008 ctrl. vs. PO; p = 0.92 IR vs. PO, one-way ANOVA), Neutrophils (n = 9-12, p = 0.005 ctrl. vs. IR; p = 0.17 ctrl. vs. PO; p = 0.13 IR vs. PO, Kruskal-Wallis test), Ly6C^{hi} monocytes (n = 9-12, p < 0.001 ctrl. vs. IR; p = 0.001 ctrl. vs. PO; p = 0.73 IR vs. PO, one-way ANOVA) and Ly6C^{lo} monocytes (n = 9-12, p = 0.004 ctrl. vs. IR; p = 0.16 ctrl. vs. PO; p = 0.074 IR vs. PO, one-way ANOVA). (**c**) Bone marrow. CD11b^{+}/Ly6G^{-} cells (n = 9-12, p = 0.39 ctrl. vs. IR; p = 0.36 ctrl. vs. PO; p = 0.95 IR vs. PO, one-way ANOVA), Neutrophils (n = 9-12, p = 0.25 ctrl. vs. IR; p = 0.35 ctrl. vs. PO; p = 0.82 IR vs. PO, Kruskal-Wallis test), Ly6C^{hi} monocytes (n = 9-12, p = 0.059 ctrl. vs. IR; p = 0.46 ctrl. vs. PO; p = 0.20 IR vs. PO, one-way ANOVA) and Ly6C^{lo} monocytes (n = 9-12, p = 0.37 ctrl. vs. IR; p = 0.12 ctrl. vs. PO; p = 0.45 IR vs. PO, one-way ANOVA). Data are presented as mean ± standard error of mean, unless otherwise specified. Symbols used are specified as *p < 0.05, **p < 0.01 and ***p < 0.001.



Supplemental Figure 8. Myeloid cell numbers in the bone marrow, spleen, and aorta of *Apoe*$^{-/-}$ mice 4 weeks after IR/PO. (**a**) Flow cytometry analysis of CD11b^{+}/Ly6G^{-} cells and neutrophils in the femur and spleen (n = 6-9, p = 0.063 ctrl. vs. IR; p = 0.071 ctrl. vs. PO for spleen CD11b^{+} cells, Kruskal-Wallis test) of *Apoe*$^{-/-}$ mice 4 weeks after IR/PO surgery. (**b**) CD11b^{+}/Ly6G^{-} (n = 6-9, p < 0.001 ctrl. vs. IR; p = 0.018 ctrl. vs. PO; p = 0.34 IR vs. PO, Kruskal-Wallis test) and neutrophil (n = 6-9, p = 0.002 ctrl. vs. IR; p = 0.044 ctrl. vs. PO; p = 0.45 IR vs. PO, Kruskal-Wallis test) counts from the aortas of *Apoe*$^{-/-}$ mice 4 weeks after IR/PO surgery. Data are presented as mean ± standard error of mean, unless otherwise specified. Symbols used are specified as *p < 0.05, **p < 0.01 and ***p < 0.001.