Supplementary Figure S1

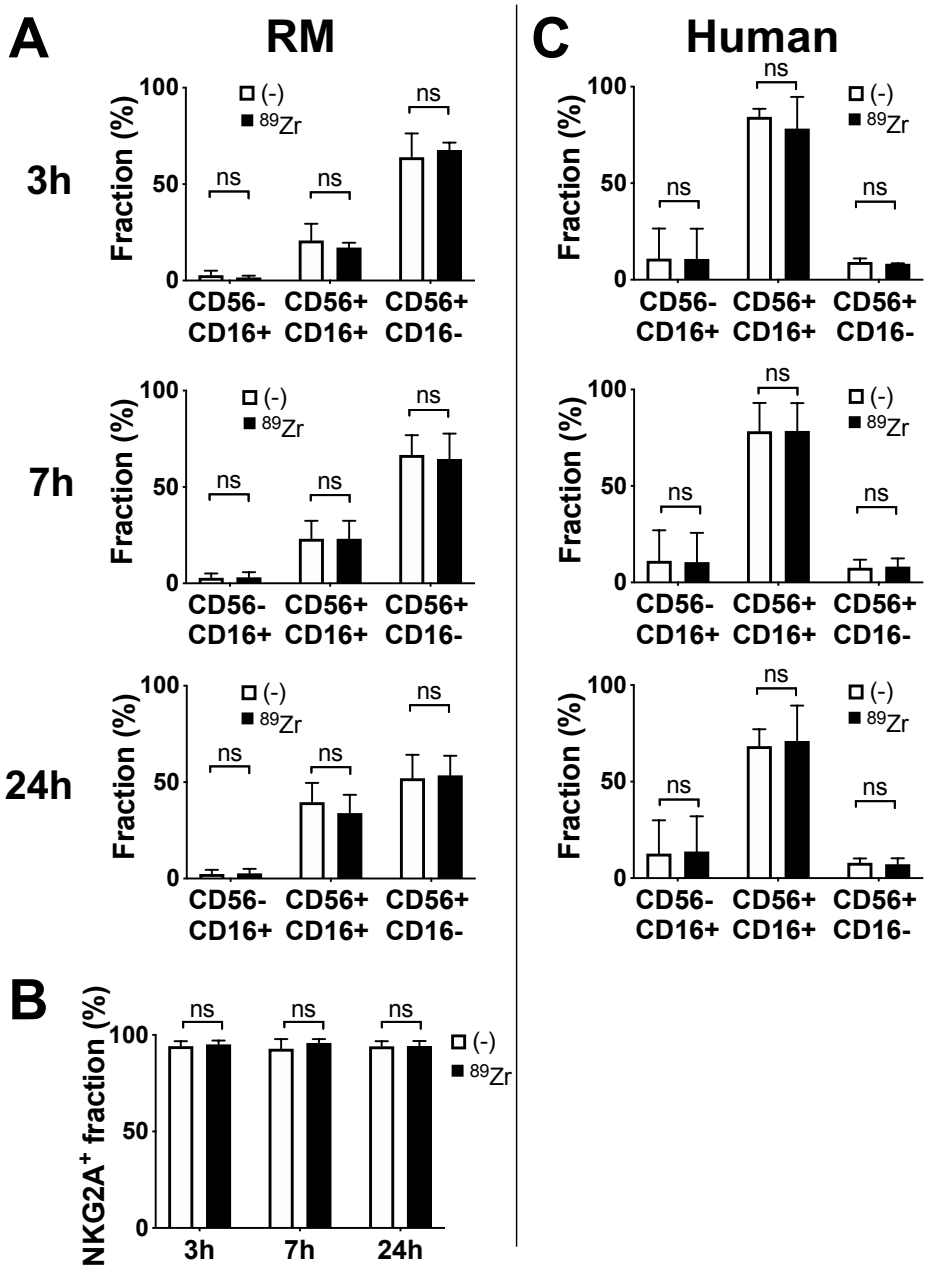

Figure S1. **^{89}Zr-oxine labeling does not alter surface phenotype of NK cells.**

A. Expression of CD56 and CD16 on *ex vivo* expanded RM NK cells from 3 unrelated RMs was examined by flow cytometry up to 24 hours after labeling. Surface expression of these markers was not altered by ^{89}Zr-oxine labeling. **B**. The majority of *ex vivo* expanded ^{89}Zr-labeled and non-labeled RM NK cells remained NKG2A positive during the 24 hours post-labeling tested (n=3). **C**. Similarly, CD56 and CD16 expression of e*x vivo* expanded NK cells from 3 unrelated humans was not altered by ^{89}Zr-labeling (n=3).

Supplementary Figure S2

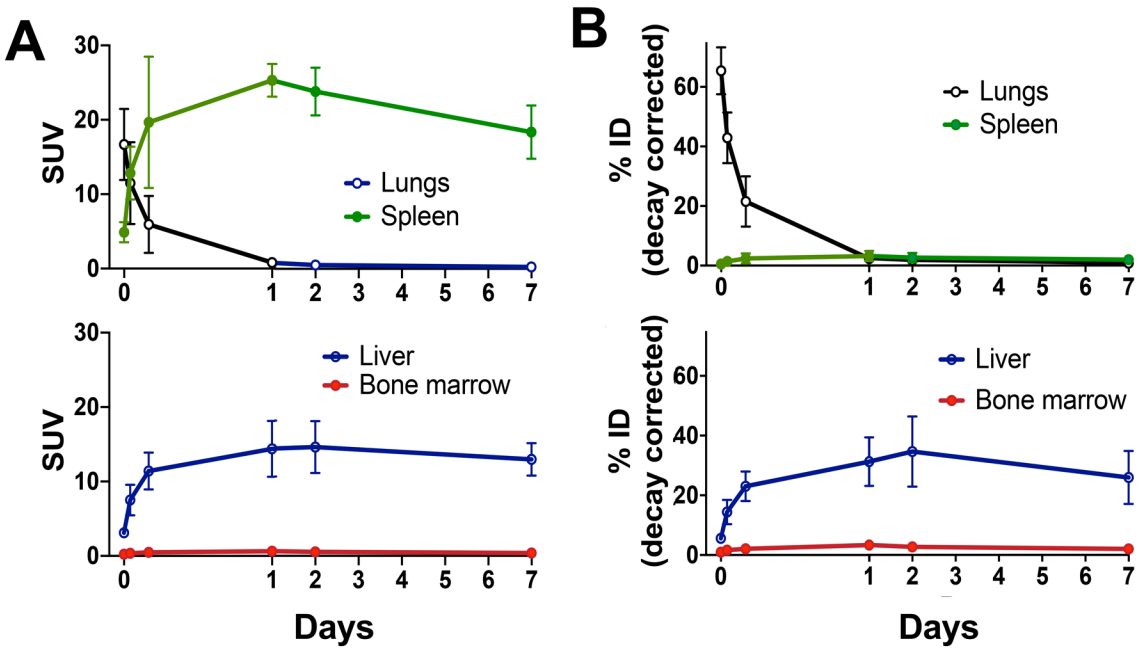

Figure S2. Quantitation of PET/CT images of adoptively transferred ^{89}Zr-oxine-labeled NK cell reveals low BM homing.
A. Kinetics of SUV values with magnified X-axis up to day 1. **B**. % ID curves with magnification of X-axis up to day 1 indicated rapid migration of the cells to the liver while homing to the BM was limited.

Supplementary Figure S3

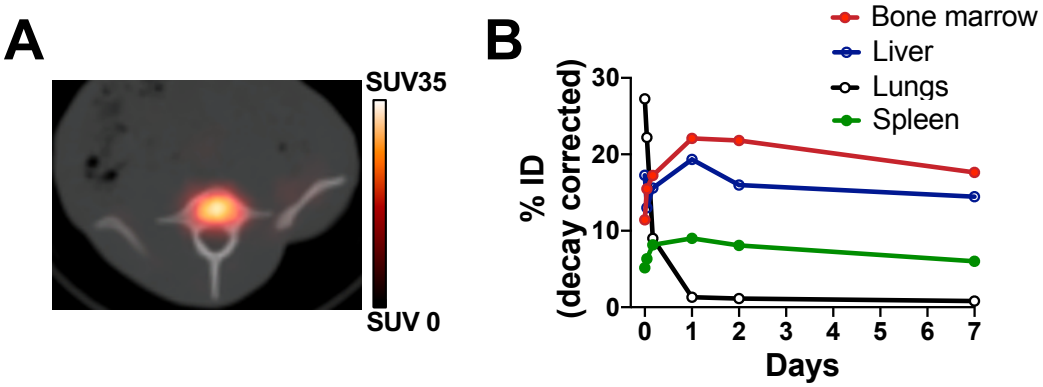

Figure S3. ^{89}Zr-oxine-labeled CD34^{+} HSPCs traffick to the BM.
A. Axial PET/CT image of mid-4th lumber spine 1 day after autologous transfer of ^{89}Zr-oxine labeled CD34^{+} HPSCs showed high cell accumulation in the center of the vertebral body which is considered to be BM area. Note higher scale setting of the image compared to that of *ex vivo* expanded NK cells (Fig. 2B) because of very strong ^{89}Zr-signals with CD34^{+} HPSCs. **B**. % ID curves demonstrated rapid migration of ^{89}Zr-oxine-labeled HSPCs to the BM.